

**Annual Report**  
of the  
**Idaho Geological Survey**

**Fiscal Year 2002**



Since 1919, Serving The State Through Geologic Research

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## Program Highlights—Fiscal Year 2002

**I**ntroduction. The Idaho Geological Survey has a statewide mission as the lead agency for collecting and disseminating geologic information and mineral data. In addition to its main office in Moscow at the University of Idaho, the Survey has branch offices in Boise at Boise State University and in Pocatello at Idaho State University. Staff geologists conduct applied research with a strong emphasis on producing geologic maps and providing technical and general information about Idaho's geology. Externally funded projects enhance this research.

Idaho experienced budget shortfalls during the past year as holdbacks were imposed on education and agencies. Budget cuts have forced the Survey to reduce its operation in research, public service, and education. For example, state funds no longer support research and provide only minimal support of earth science education. The operating expense budget of the Survey was cut 61.8% from the FY-2001 base. The proposed operating budget for FY-2003 is less than any budget in the last 29 years: the last 18 years as the Idaho Geological Survey and the 11 years prior to that as the Idaho Bureau of Mines and Geology.

The University of Idaho reorganized its colleges during FY-2002. The College of Mines and Earth Resources has been replaced by a new College of Science. In response to the budget decreases, the University offered severance packages to staff and faculty for early retirement in 2002 and 2003. Bill Bonnichsen announced his retirement effective June 2003, and Director Earl Bennett, presently the interim dean of the new College of Science, also announced his retirement. The college reorganization will require an administrative realignment of the Survey within the University. The Survey's enabling legislation will also need revision to reflect this realignment and to internalize the director's position.

**P**ublications. In the past 10 years, the Survey has released 195 publications in a variety of formats that include books, maps, reports, posters, and fact sheets. This output represents a substantial gain in recent knowledge on the state's geology. Remarkably, it also accounts for over 30 percent of all the published research in the Survey's 83-year history. This solid productivity can be attributed to three factors: experienced staff, prudent investment in computer technology, and success in obtaining external research funds to augment state appropriations.

The Survey devotes most of its resources to geologic mapping throughout the state, particularly at 1:24,000 and 1:100,000 scales. Cooperative federal grants and contracts have provided much-needed funding for this research. At the same time, the publishing of maps has changed dramatically. Extraordinary advances in cartography through computer hardware and software make it possible to generate better maps today than ever before.

**I**daho Geology, the Web site—[www.idahogeology.org](http://www.idahogeology.org). Viewable on the Internet, interest in the site has been strong and the offerings continue to expand through new Web pages and publications and an ever-widening network of links. The Web site offers the Survey multiple opportunities to get information before the public. The searchable *List of Publications* and a searchable *Index to Geologic Maps* are always on line. The Web site provides electronic access to selected geologic maps, GIS databases, and wide-ranging information such as geologic hazards and earth science education. A new series devoted to digital Web maps in PDF format can be downloaded free of charge.

**G**eological mapping and related research. Central to the Survey's applied research is geologic mapping and related topical studies that together form the technical content of digital geologic maps, databases, reports, and publications. Since 1985 the Survey has been conducting detailed geologic mapping in selected urban-impact areas. The Survey participates in the U.S. Geological Survey's STATEMAP program, which since 1990 has augmented geologic mapping in urban areas and development-impact corridors throughout Idaho. The State Mapping Advisory Committee of which the Survey is a member was reorganized to better assess Idaho's mapping needs and address long-term plans for geologic mapping. During the year, STATEMAP project geologists mapped twenty-seven 7.5-minute quadrangles. Of these, nine individual geologic maps at 1:24,000 scale were made available to the public. The Murphy 30' x 60' quadrangle was completed and included new mapping in seven 7.5-minute quadrangles. The U.S. Geological Survey's Headwaters project and the Idaho Department of Lands helped support regional geologic mapping in the large areas of the state that have not been studied in detail. This year the Headquarters 30' x 60' quadrangle was digitized from new interpretations on 1:24,000-scale sheets, fifteen of which required field mapping during the project. All of these new data will be entered into the statewide digital database. Following review and corrections, all the new geologic maps will be published as print-on-demand color maps.

The Survey cooperates with several universities by endorsing EDMAP proposals for student geologic mapping in several areas of Idaho and participates in the Association of American State Geologists's Mentored Field Experience Program funded by the National Science Foundation and the U.S. Geological Survey.

**G**eologic map production and publishing. The Survey's digital mapping and GIS laboratory performs services ranging from digital cartography to spatial data management. The lab uses computer-aided design and GIS software to produce maps for publication and to fashion existing geologic maps into digital-map compilations. Most new geologic maps published by the Survey are available as full color, print-on-demand products. Twelve maps were released in FY-2002.

The Survey participates in the North American Data Model Steering Committee that provides guidelines for digital-legend design for geologic maps. The Digital Data Series is a new publication category for Idaho that is undergoing careful research and development. The first publications in the new series were released this year.

**H**ydrogeology. The Survey has a number of hydrologic projects in cooperation with other state and federal agencies, university programs, and water-user groups. These projects contribute to a better understanding of geologic controls on recharge and ground-water flow and of the distribution and transport of ground-water contaminants. This technical information is then provided to end-users for ground-water resource development and protection. Research applications include quantifying ground-water resources, data analysis and mapping of ground-water quality, and integration of surface geological and subsurface hydrogeological information to assess ground-water vulnerability.

A statistical approach to analyzing the state's ground-water quality database is being developed to assist other agencies in managing Idaho's ground-water resources. The Survey is working with the Department of Water Resources, the Department of Environmental Quality, and the U.S. Geological Survey to develop statistically-based GIS tools for identifying areas of water quality concern, defining trends and spatial boundaries, and prioritizing problem areas.

In the lower Portneuf Valley aquifer, cooperation between various area jurisdictions, the Environmental Protection Agency, the local county Health District, and citizen groups has led to a prototype effort to develop protection and management methods for the area's ground-water resources. The work includes a functioning environmental GIS database for aquifer vulnerability assessment, a special Web site developed in cooperation with the Portneuf Groundwater Guardian and the cities of Pocatello and Chubbuck, and ongoing technical assistance to city and county leaders and management staff.

The Survey is involved in funded research projects to map water quality in the Treasure Valley and Twin Falls areas and other areas of the state, to map surficial geology and aquifer characteristics in the Big Wood River Valley, and to develop technical criteria for assessing septic drain field performance in the lower Portneuf Valley. In addition, the Survey and the Idaho Water Resources Research Institute began an EPA-funded program to provide geologically based ground-water information to rural communities that have critical water issues.

**D**atabases, bibliographies, and collections. Many of the digital geologic maps are also available as GIS databases. Other databases include information on the state's

Mines and Prospects, earthquakes, faults, and landslides. Digital geologic databases and earthquake information are available on the Web site. Several technical bibliographies are published. A collection of over 1,200 theses and dissertations on Idaho's geology are available at the Moscow Office. The Survey recently completed a new digital database and an *Index to Geologic Maps* funded by the Idaho Board of Education. To date, the areal coverages of 614 thesis maps have been digitized for inclusion in the searchable database. These products will complement the existing U.S. Geological Survey's index available on the Internet.

**G**eologic hazards. As the state's population has grown and disaster losses have increased, the Survey devotes increasing time to geologic-hazard mitigation. The agency works in close cooperation with the Idaho Bureau of Disaster Services, both formally and informally, to mitigate, respond to, and recover from the impacts of floods, fires, landslides, and earthquakes and to provide technical analysis when needed.

The Survey's digital mapping laboratory designed a statewide landslide database for use by state and federal agencies, local planners, and emergency response personnel. The Survey's new surficial geologic maps are an integral part of Nez Perce County's geologic hazards interpretation project. A similar project is beginning in Clearwater County.

The Survey has finished a seismic-shaking study of the Boise metropolitan area. The Idaho active fault map has been reviewed and updated and will be released in the next year. The mapped faults are linked to an extensive database as well as an earthquake reference collection.

As an active participant in the Western States Seismic Policy Council (WSSPC) and Pacific Northwest and Intermountain regional planning groups of the Advanced National Seismic System, the Survey is involved in organizing seismic network operators and planning several hazard mitigation projects. The Survey is organizing a state geologic hazards clearinghouse capability in cooperation with the Idaho Bureau of Disaster Services and is already participating at regional clearinghouse planning functions with the other Basin-and-Range states in WSSPC.

Mitigation of natural hazards is a major component of the Survey's annual summer workshop for teachers. Training activities provide knowledge of Idaho's tectonic setting and classroom safety and disaster response. Master teachers successfully developed and tested classroom activities for geologic-hazard education.

**M**ines and the geology of mines. The Survey maintains a working knowledge of the geology and status of all active and many inactive mines in the state. Information and statistics on Idaho's mines, including production, exploration, and reclamation

information, are collected and published annually. An overview of the year's mining and exploration activity is presented each December at the annual meeting of the Northwest Mining Association. In addition, the Survey cooperates with the U.S. Geological Survey to collect and interpret mining information and to publish the annual review and production statistics. The Survey's summary of Idaho's mineral industry is published annually in the May issue of *Mining Engineering* journal, in the U.S. Geological Survey's *Minerals Yearbook*, and in the Idaho Department of Commerce *Idaho Facts* newsletter. After a major downturn in the metals' market, commodity prices, especially for gold and molybdenum, were up in 2002, and there has been a slight increase in exploration and metal mining activity in Idaho. Industrial mineral operations, such as sand and gravel, were fairly stable.

The Survey continued to inventory and evaluate abandoned and inactive mines in Idaho. A major project was conducted in cooperation with the Boise National Forest. Thirty sites were inventoried on the Boise Forest, including many that were noted in the initial inventory of 1994. Geochemical sampling of water and solid materials, such as tailings, was conducted along with video documentation and mapping. Results identify physical and environmental hazards for possible future remediation. Increasing residential and recreational use of the Boise Basin mining district has led to increased concern about the hazards associated with the old mines. Past work for the U.S. Bureau of Land Management was also completed.

An outgrowth of previous mine inventory work has been a small research project in the Lemhi Pass Thorium District of Lemhi County. The Survey's economic geologist worked with out-of-state university colleagues to obtain U-Pb electron microprobe and Re-Os geochronology on samples from one of the Lemhi Pass thorium deposits and a copper mine, respectively. The matching results document a Precambrian age (about 1.05 billion years old) for the primary copper and thorium mineralization with subsequent Paleozoic hydrothermal activity that redistributed some of the thorium. This is the first use of these valuable tools in Idaho and the only geochronology on pre-Tertiary rocks in that area.

**E**arth science education. The Survey staff supports a variety of formal and informal geologic education efforts throughout the state, the region, and the nation. Through close working relationships with the geology departments at the three state universities, Survey geologists make their expertise available by participating in seminars, field trips, and workshops, by teaching selected upper-division courses, and by directing graduate student research. Survey geologists contributed to a geology, minerals, and mining exhibit at the Idaho Science Teachers Association meeting in Idaho Falls. The exhibit was cooperatively sponsored by the Survey, the Society of Mining Engineers, and the Minerals Education Coalition. Survey geologists also designed and implemented

displays, handouts, and field trips for the Ice Age Floods Institute, highlighting the ice-dam story of Glacial Lake Missoula in northern Idaho.

Through limited external funds, the Earth Science Education Coordinator guides and helps conduct the Survey's education program. The Survey is primarily engaged in promoting earth science education with the state's teachers through the Idaho Earth Science Teachers Association, by hosting the IESTA's Web site at [www.idahogeology.org](http://www.idahogeology.org), and with field workshops conducted around the state so that teachers can observe the methods and science of geology in Idaho's own outdoor laboratory. Idaho is one of a handful of states in which the state geological survey and earth science teachers work closely to enhance the teaching of earth science at the elementary and secondary level. This includes cooperating with selected master teachers to classroom-test student activities for geologic-hazard education, a project funded by EPSCoR. The Survey's partnership with teachers includes Earth Science Week activities in early October and the summer field workshop. As part of the field workshop, the Survey cosponsors and incorporates hazards mitigation education in cooperation with the Idaho Bureau of Disaster Services. The summer of 2001 marked the 22nd teacher workshop the Survey has conducted since 1986.



# Staff Publications and Activities

## Fiscal Year 2002

### Publications

- Agency Activities—Fiscal Year 2001:* Idaho Geological Survey Web site on Web page, “Agency Activities,” 2002.
- Bedrock Geologic Map of the Genesee Quadrangle, Latah and Nez Perce Counties, Idaho,* by J.H. Bush: Idaho Geological Survey Geologic Map 30, 2001, scale 1:24,000.
- Bedrock Geologic Map of the Green Knob Quadrangle, Latah and Nez Perce Counties, Idaho,* by J.H. Bush, D.L. Garwood, R.S. Lewis, G.N. Potter, and W.C. McClelland: Idaho Geological Survey Geologic Map 31, 2001, scale 1:24,000.
- Digital Geologic Map Compilation of the Elk City 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis and L.R. Stanford; digital compilation by L.R. Stanford, T. Funderburg, and B.B.E. Studer: Idaho Geological Survey Digital Geologic Map 5, 2002, scale 1:1,000,000.
- Digital Geologic Map Compilation of the Hamilton 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis and L.R. Stanford; digital compilation by L.R. Stanford, J.S. Freed, T. Funderburg, and B.B.E. Studer: Idaho Geological Survey Digital Geologic Map 3, 2002, scale 1:1,000,000.
- Digital Geologic Map Compilation of the Kooskia 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis and L.R. Stanford; digital compilation by L.R. Stanford, T. Funderburg, and B.B.E. Studer: Idaho Geological Survey Digital Geologic Map 6, 2002, scale 1:1,000,000.
- Digital Geologic Map Compilation of the Missoula West 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis and L.R. Stanford; digital compilation by L.R. Stanford, J.S. Freed, T. Funderburg, and B.B.E. Studer: Idaho Geological Survey Digital Geologic Map 2, 2002, scale 1:1,000,000.
- Digital Geologic Map Compilation of the Nez Perce Pass 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis and L.R. Stanford; digital compilation by L.R. Stanford, T. Funderburg, and B.B.E. Studer: Idaho Geological Survey Digital Geologic Map 4, 2002, scale 1:1,000,000.
- Digital Geologic Map of the St. Maries 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis, R.F. Burmester, J.D. Kauffman, and T.P. Frost; digital compilation by L.R. Stanford, J.S. Freed, V.T. MacKubbin, and A.K. Schlerf: Idaho Geological Survey Digital Geologic Map 1, 2002, scale 1:1,000,000.
- Field Trip Guide: Glacial Lake Missoula Flood Deposits and Related Features of the Rathdrum Prairie,* by R.M. Breckenridge and K.L. Othberg: Northwest Geology, 2001, v. 30, p. 62-66.
- Geologic Map Compilation of the Hamilton 30 x 60 Minute Quadrangle, Idaho,* by R.S. Lewis and L.R. Stanford: Idaho Geological Survey Geologic Map 32, 2002, scale 1:1,000,000.
- Geologic Map of the Lava Hot Springs Quadrangle, Bannock County, Idaho,* by T.J. Crane, P.K. Link, and S.S. Oriol: Idaho Geological Survey Technical Report 01-3, 2001, scale 1:24,000.
- Geology and Hydrology of Western Jerome County, Idaho,* by V.S. Gillerman and T.A. Schiappa: Idaho Geological Survey Staff Report 01-2, 2002, 1 plate, 47 p.
- The History of the Fabulous Coeur d’Alene Mining District,* by E.H. Bennett: Northwest Geology, 2001, v. 30, p. 3.
- Idaho Geological Survey Activities Report,* by R.M. Breckenridge: Western States Seismic Policy Council Annual 2001 Conference Program, 2001, p. 16-18.
- List of Publications, 2002,* by R.C. Stewart: Idaho Geological Survey booklet, 2002, 47 p.
- List of Publications, 2002,* by R.C. Stewart with B.B.E. Studer: Idaho Geological Survey Web site.
- Mineral Industry of Idaho (2000),* by A. Tanner and S.D. Smith with V.S. Gillerman: U.S. Geological Survey Mineral Industry Surveys and Minerals Yearbook Chapter, v. II, p. 14.1-

- 14.5, November, 2001.
- Mining and Exploration in Idaho, 2001*, by V.S. Gillerman and E.H. Bennett: Mining Engineering, May, 2002, v. 54, no. 5, p. 58-60.
- Modeling Ground Water Flow and Transport in the Snake River Plain Aquifer: A Stochastic Approach*, by E.L. Gego, G.S. Johnson, M.R. Hankin, A.H. Wylie, and J.A. Welhan, in P.K. Link and L.L. Mink, eds., *Geology, Hydrogeology and Environmental Remediation*, Idaho National Engineering and Environmental Laboratory, Eastern Snake River Plain, Idaho: Geological Society of America Special Paper 353, 2002, p. 249-262.
- Morphology of Inflated Pahoehoe Lavas and Spatial Architecture of Their Porous and Permeable Zones, Eastern Snake River Plain, Idaho*, by J.A. Welhan, C.M. Johannesen, K.S. Reeves, T.M. Clemo, J.A. Glover, and K.W. Bosworth, in P.K. Link and L.L. Mink, eds., *Geology, Hydrogeology and Environmental Remediation*, Idaho National Engineering and Environmental Laboratory, Eastern Snake River Plain, Idaho: Geological Society of America Special Paper 353, 2002, p. 135-150.
- An Overview of the Geology of the Coeur d' Alene Area*, by R.S. Lewis: Tobacco Root Geological Society Annual Field Conference, Northwest Geology, v. 30, 2001, p. 1-2.
- Post-Earthquake Technical Clearinghouse Workshop March 26-27, 2001*, Proceedings Volume compiled by Craig dePolo and R.M. Breckenridge: Western States Seismic Policy Council, October, 2002, 48 p.
- Road Log to the Belt Supergroup Along the North Fork of the Coeur d' Alene River, Northern Idaho*, by M.D. McFadden, R.S. Lewis, and R.F. Burmester: Northwest Geology, v. 30, 2001, p. 67-78.
- Stochastic Simulation of Aquifer Heterogeneity in a Layered Basalt Aquifer System, Eastern Snake River Plain, Idaho*, by J.A. Welhan, T.M. Clemo, and E.L. Gego, in P.K. Link and L.L. Mink, eds., *Geology, Hydrogeology and Environmental Remediation*, Idaho National Engineering and Environmental Laboratory, Eastern Snake River Plain, Idaho: Geological Society of America Special Paper 353, 2002, p. 225-247.
- Surficial Geologic Map of the Genesee Quadrangle and Part of the Uniontown Quadrangle, Latah County, Idaho*, by K.L. Othberg, R.M. Breckenridge, and D.W. Weisz: Idaho Geological Survey Surficial Geologic Map 13, 2001, scale 1:24,000.
- Surficial Geologic Map of the Green Knob Quadrangle, Latah and Nez Perce Counties, Idaho*, by K.L. Othberg, R.M. Breckenridge, and D.W. Weisz: Idaho Geological Survey Surficial Geologic Map 10, 2001, scale 1:24,000.
- Surficial Geologic Map of the Moscow West Quadrangle and Part of the Moscow East Quadrangle, Latah County Idaho* by K.L. Othberg and R.M. Breckenridge: Idaho Geological Survey Surficial Geologic Map 11, 2001, scale 1:24,000.
- Surficial Geologic Map of the Robinson Lake Quadrangle, and Part of the Viola Quadrangle, Latah County Idaho*, by K.L. Othberg and R.M. Breckenridge: Idaho Geological Survey Surficial Geologic Map 12, 2001, scale 1:24,000.
- Tour of the Clark Fork Ice Dam and Glacial Lake Missoula*, by R.M. Breckenridge: Ice Age Floods Institute, Cloudsledge Foundation, Pilot Study, 2001, 8 p.
- Water Quality in the Portneuf Aquifer, Pocatello-Chubbuck Area, Idaho: The Case for Protection*, by J.A. Welhan, Journal of the Idaho Academy of Science, 2001, v. 37, p. 88-92.

## Abstracts

- Drink and Be Merry: Water, Management, and Policy*, by J.A. Welhan: Science and Society Centennial Symposium, Idaho State University, Program of Activities, 2002, p. 12.
- Miocene to Pleistocene Rhyolite-Basalt Volcanism and Tectonism, Western Snake River Plain and Owyhee Mountains, SW Idaho*, by B. Bonnicksen and M.M. Godchaux: Geological Society of

- America Abstracts with Programs, 2002, v. 34, no. 5.
- New Geologic Mapping Results From STATEMAP Projects in Idaho*, by R.S. Lewis, R.M. Breckenridge, and K.L. Othberg: Geological Society of America Abstracts with Programs, 2002, v. 34, no. 4.
- Newly Mapped Eocene Strike-Slip Faults South of the Boehls Butte Anorthosite, Northern Idaho*, by R.S. Lewis, R.F. Burmester, T.P. Frost, and W.C. McClelland: Geological Society of America Abstracts with Programs, 2002, v. 34, no. 5, p. A-84.
- Newly Recognized Basement(?) to the Belt Supergroup, Northern Idaho*, by R.S. Lewis, R.F. Burmester, and W.C. McClelland: Geological Society of America Abstracts with Programs, 2001, v. 33, no. 6, p. A-434.
- Subdivisions of the Mesoproterozoic Yellowjacket Formation and Hoodoo Quartzite, Salmon River Mountains, Central Idaho*, by P.K. Link, Don Winston, and R.S. Lewis: Geological Society of America Abstracts with Programs, 2002, v. 34, no. 4.
- Reports and Presentations**
- Drink and Be Merry: Water, Management, and Policy*, by J.A. Welhan: Science and Society Centennial Symposium, Idaho State University, February.
- Earthquakes in Idaho, 1872-2000*, by G.W. Adema and R.M. Breckenridge: Report to Idaho Bureau of Disaster Services, color digital map on shaded relief base, version 10-2001, scale 1:1,000,000, October.
- An Estimation of the Ground-Shaking Hazard Due to Seismically Induced Bedrock Motion in the Eastern Boise Valley, Idaho*, by B.K. Peterson, G.W. Adema, and R.M. Breckenridge: Idaho Geological Survey unpublished report to Idaho Bureau of Disaster Services, 53 p. with maps.
- Evolution of the Snake River Plain Volcanic and Tectonic System in Southwestern Idaho*, by B. Bonnicksen: seminar, Department of Geosciences, Boise State University, October.
- Geohydrology and Ground-Water Remediation Workshop*, by J.A. Welhan: Idaho Department of Environmental Quality staff technical workshop, Pocatello, June.
- Geology of Lewiston-Clarkston Valley*, by T.C. Walker: Sacajawea Junior High School field trip, Lewiston, April; Lewiston High School field trip, Lewiston, June.
- Glacial Lake Missoula Flood Deposits and Related Features of the Rathdrum Prairie*, by R.M. Breckenridge: Tobacco Root Geological Society 26th Field Conference, Coeur d'Alene, August.
- Got Digital Map Data. Now What? How the Idaho Geological Survey Distributes Digital Geologic Map Data*, by B.B.E. Studer and L.R. Stanford: Digital Mapping Techniques Workshop, poster session, Salt Lake City, Utah, May.
- A Ground-Water Protection Approach for the Pocatello-Chubbuck Area*: by J.A. Welhan: Cities-County Meeting, Bannock County Commission, Pocatello, February.
- Ice Age History of the Hope Area, Idaho*, by R.M. Breckenridge: Bonner County Historical Society Annual Meeting, Hope, April.
- Idaho Geological Survey Earth Science Education, Earth Science Week, Educational Resources, and Geology and Geologic Hazards*, by T.C. Walker, tri-fold brochure, October.
- Idaho Geological Survey Geologic Maps*, by L.R. Stanford and J.S. Freed: Latah County Library display, Moscow, February.
- Idaho Geological Survey Information on Drinking Water and Geology*, by V.S. Gillerman: Drinking Water Protection Open House Meeting, Idaho Association of Cities, Boise, January; Nampa, March.
- Idaho Geological Survey Information on Drinking Water and Geology*, by V.S. Gillerman and J.A. Welhan: Drinking Water Protection Open House Meeting, Idaho Association of Cities, Twin Falls, January.
- Idaho Geological Survey Information on Drinking Water and Geology*, by J.A. Welhan: Drinking

- Water Protection Open House Meeting, Idaho Association of Cities, Idaho Falls, February.
- Idaho Geological Survey Information on Drinking Water and Geology in Kootenai County*, by R.M. Breckenridge: Drinking Water Protection Open House Meeting, Idaho Association of Cities, Coeur d' Alene, February.
- Idaho Geological Survey Information on Drinking Water and Geology in Nez Perce County*, by K.L. Othberg: Drinking Water Protection Open House Meeting, Idaho Association of Cities, Lewiston, February.
- Idaho Geological Survey State Geologic Mapping Plan*, by R.M. Breckenridge and K.L. Othberg: State Mapping Advisory Committee Annual Meeting, Boise, September.
- Idaho Geological Survey Surficial Geologic Mapping in Nez Perce and Clearwater Counties*, by K.L. Othberg and R.M. Breckenridge: Clearwater County Landslide Committee, Orofino, November.
- Idaho Mining*, by V.S. Gillerman: U.S. Forest Service Retirees Club, Boise, April.
- Idaho Rocks and Minerals Education Exhibit*, by V.S. Gillerman: Idaho Science Teachers Association Convention, Idaho Falls, October.
- Kriging As a Tool for Defining Spatial-Temporal Trends in Ground-Water Quality*, by J.A. Welhan: Department of Environmental Quality Ground-Water Monitoring Technical Committee, Boise, January.
- Kriging Applications for Statewide Monitoring Network Data*, by J.A. Welhan: Idaho Department of Water Resources, Boise, November.
- Microgravity and Magnetic Detection of Mafic Dikes, Fissures, and Lava Tubes in Basalt: Potential Barriers and Fast-Flow Paths for Contaminant Migration Within the Eastern Snake River Plain, Idaho*, by J.M. Kruger, A.C. Smith, and J.A. Welhan: Society of Exploration Geophysicists Annual Meeting, Salt Lake City, Utah, October.
- Mining and Exploration in Idaho, 2001*, by V.S. Gillerman: Northwest Mining Association 107th Annual Meeting, Spokane, Washington, December.
- Miocene and Younger Faults in Idaho*, compiled by R.M. Breckenridge, R.S. Lewis, G.W. Adema, and D.W. Weisz: Idaho Geological Survey unpublished report to Idaho Bureau of Disaster Services, color digital map on relief base, version 10-2001, scale 1:1,000,000.
- Miocene to Pleistocene Rhyolite-Basalt Volcanism and Tectonism, Western Snake River Plain and Owyhee Mountains, SW Idaho*, by B. Bonnichsen and M.M. Godchaux: Cordilleran Section, Geological Society of America Annual Meeting, Corvallis, Oregon, May.
- The Need for Ground-Water Protection*, by J.A. Welhan: Pocatello Kiwanis Club, Pocatello, October.
- New Geologic Mapping Results From STATEMAP Projects in Idaho*, by R.S. Lewis, R.M. Breckenridge, and K.L. Othberg: Rocky Mountain Section, Geological Society of America Annual Meeting, Cedar City, Utah, May.
- Newly Mapped Eocene Strike-Slip Faults South of the Boehls Butte Anorthosite, Northern Idaho*, by R.S. Lewis, R.F. Burmester, T.P. Frost, and W.C. McClelland: Geological Society of America, Cordilleran Section, Annual Meeting, Corvallis, Oregon, May.
- Newly Recognized Basement(?) to the Belt Supergroup, Northern Idaho*, by R.S. Lewis, R.F. Burmester, and W.C. McClelland: Geological Society of America Annual Meeting, Boston, Massachusetts, November.
- Oil and Gas Exploration and Log Interpretation of the Bear Lake Valley, Idaho*, by R.M. Breckenridge: Idaho Geological Survey earth science education workshop, Montpelier, July.
- Overview of the Geology of the Coeur d' Alene Area*, by R.S. Lewis: Society of American Foresters, Coeur d' Alene chapter, January.
- An Overview of the Geology of the Coeur d' Alene Area*, by R.S. Lewis: Tobacco Root Geological Society Annual Field Conference, Wallace, August.
- Overview of the Ice Age Floods in Northern Idaho*, by R.M. Breckenridge and T.C. Walker: Cloudsledge Foundation and Ice Age Floods Institute, Hope, September.

- Preliminary Landslide Map of the Coeur d' Alene Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Preliminary Landslide Map of the Fernan Lake Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Preliminary Landslide Map of the Harrison Quadrangle, Kootenai and Benewah Counties, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Preliminary Landslide Map of the Mica Bay Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Preliminary Landslide Map of the Mt. Coeur d' Alene Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Preliminary Landslide Map of the Rockford Bay Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Preliminary Landslide Map of the Worley Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and D.W. Weisz: Idaho Geological Survey unpublished map for Idaho Bureau of Disaster Services, scale 1:24:000, October.
- Progress Report on Geologic Mapping and Belt Stratigraphy of the Headquarters Quadrangle, Idaho*, by R.S. Lewis: Belt Association session, Northwest Mining Association 107th Annual Meeting, Spokane, Washington, December.
- Protecting Our Drinking Water—Business Perspectives*, by J.A. Welhan: Public panel discussion and information session, City of Pocatello and Idaho Department of Environmental Quality, Pocatello, October.
- Protecting Our Drinking Water—Community Perspectives*, by J.A. Welhan: Public panel discussion and information session, City of Pocatello and Idaho Department of Environmental Quality, Pocatello, October.
- Proterozoic Geology of the Potlatch 30' x 60' Quadrangle*, by R.S. Lewis: University of Idaho and Washington State University graduate seminar in geology series, September.
- Recommendations for Protecting Ground Water*, by J.A. Welhan: Chubbuck City Council, October.
- Recommendations for Protecting Ground Water*, by J.A. Welhan: Pocatello City Council, October.
- Recommendations for Protecting Ground Water and a Draft Memorandum of Agreement for a Public Advisory Process*, by J.A. Welhan: Bannock County Commission, January.
- Recommendations for Protecting Ground Water and a Draft Memorandum of Agreement for a Public Advisory Process*, by J.A. Welhan: Chubbuck City Council, January.
- Recommendations for Protecting Ground Water and a Draft Memorandum of Agreement for a Public Advisory Process*, by J.A. Welhan: Pocatello City Council, January.
- Report of Idaho Geological Survey Geologic Hazard Education Activities for 2001*, by T.C. Walker: Idaho Geological Survey unpublished report to Idaho Bureau of Disaster Services, October, 2 p.
- Rocks and Minerals*, by V.S. Gillerman: 5th Grade Classes, Adams Elementary School, Boise, February.
- Seismic Shaking Hazard in Idaho Falls, Idaho*, by B.K. Peterson, G.W. Adema, and R.M. Breckenridge: Idaho Geological Survey unpublished report to Idaho Bureau of Disaster Services, 2 p.
- Should the Lower Portneuf River Aquifer Be Classified As a Sensitive Resource?* by J.A. Welhan: Earth Week panel discussion, Student Action Volunteers for the Environment/ISU Recycling Committee, Idaho State University, April.

- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Challis Resource Area*, by V.S. Gillerman, B.R. Otto, T.A. Schiappa, and Tracy Morrison: Idaho Geological Survey unpublished report, April, 138 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Mackay Region*, by V.S. Gillerman and T.A. Schiappa: Idaho Geological Survey unpublished report, June, 51 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Nez Perce National Forest: Volume III, Section A: Elk City, Orogrande, Buffalo Hump, and Surrounding Areas, Idaho County, Idaho*, by Ted Erdman, J.D. Kauffman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, July, 2001, 340 p., 2 videotapes.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Nez Perce National Forest: Volume III, Section B: Elk City, Orogrande, Buffalo Hump, and Surrounding Areas, Idaho County, Idaho*, by Ted Erdman, J.D. Kauffman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, July, 2001, 338 p., 2 videotapes.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Nez Perce National Forest: Volume III, Section C: Elk City, Orogrande, Buffalo Hump, and Surrounding Areas, Idaho County, Idaho*, by Ted Erdman, J.D. Kauffman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, August, 2001, 371 p., 3 videotapes.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 4), Boise National Forest: Volume I: Atlanta Area, Elmore County, Idaho*, by J.D. Kauffman, Ted Erdman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, June, 2002, 292 p., 3 videotapes.
- Stochastic Simulation of Heterogeneity in a Layered Basalt-Sedimentary Aquifer, Idaho*, by J.A. Welhan: Inland Northwest Research Alliance Subsurface Science Symposium, October.
- Subdivisions of the Mesoproterozoic Yellowjacket Formation and Hoodoo Quartzite, Salmon River Mountains, Central Idaho*, by P.K. Link, Don Winston, and R.S. Lewis: Geological Society of America, Rocky Mountain Section, Annual Meeting, Cedar City, Utah, May.
- Surficial Geologic Map of the Ahsahka Quadrangle, Clearwater County, Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Bellevue Quadrangle, Blaine County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Dent Quadrangle, Clearwater County, Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Gifford Quadrangle, Nez Perce County, Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Hailey Quadrangle, Blaine County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Orofino East Quadrangle, Clearwater and Lewis Counties, Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Orofino West Quadrangle, Clearwater, Lewis and Nez Perce Counties, Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Surficial Geologic Map of the Peck Quadrangle, Clearwater, Lewis and Nez Perce Counties*,

*Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.

*Surficial Geologic Map of the Southwick Quadrangle, Clearwater and Nez Perce Counties, Idaho*, by K.L. Othberg, D.W. Weisz, and R.M. Breckenridge: Idaho Geological Survey unpublished map, scale 1:24,000, April.

*An Update of Digital Geologic Mapping Projects in Idaho*, by R.S. Lewis: Intermountain Forest Tree Nutrition Cooperative Annual Meeting, Moscow, April.

## Professional Activities

Association of American State Geologists, Western Cluster Meeting, Sacramento, California, October (R.M. Breckenridge).

Boise Section meetings, Society for Mining, Metallurgy, and Exploration (V.S. Gillerman).

Chair, Geoscience Education Division meeting, Geological Society of America, Boulder, Colorado, February (T.C. Walker).

Chair, Portneuf Ground Water Forum, City of Pocatello (J.A. Welhan).

Co-chair and convenor, Portneuf Aquifer Protection Working Group, Pocatello (J.A. Welhan).

Co-supervisor, Digital geologic mapping laboratory, Idaho Geological Survey-Department of Geosciences, Idaho State University (J.A. Welhan).

Councilor, Society of Economic Geologists (V.S. Gillerman).

Councilor-at-Large, Pacific Northwest Section, National Association of Geoscience Teachers (T.C. Walker).

Curriculum project progress review trip, Meridian, Eagle, Twin Falls, and Montpelier, February (T.C. Walker).

Director, Paleomagnetism laboratory, Idaho Geological Survey-College of Mines and Earth Resources, University of Idaho (K.L. Othberg).

Exhibitor, Idaho Science Teachers Association Convention, Idaho Falls, October (V.S. Giller-

man).

Federal Emergency Management Agency meeting, April 2001 Nisqually earthquake response and coordination report, Idaho Bureau of Disaster Services, Boise, August (R.M. Breckenridge, K.L. Othberg).

Fellow, Geological Society of America (B. Bonnichsen).

Fellow, Society of Economic Geologists (B. Bonnichsen, V.S. Gillerman).

Field trip, Belt rocks of the Alberton Gorge, western Montana, Tobacco Root Geological Society 26th Field Conference, Wallace, August (R.M. Breckenridge, R.F. Burmester, R.S. Lewis, W.L. Oakley).

Field trip, The Belt Supergroup along the North Fork of the Coeur d' Alene River, Tobacco Root Geological Society 26th Field Conference, Wallace, August (R.S. Lewis).

Field trip, Bimodal volcanism and tectonism of the High Lava Plains, Oregon, Geological Society of America, Cordilleran Section, May (B. Bonnichsen, M.M. Godchaux).

Field trip, Exploring petrologic and tectonic intimacy in a propagating intra-arc rift, north-central Oregon Cascades, Geological Society of America, Cordilleran Section, May (B. Bonnichsen, M.M. Godchaux).

Field trip, Glacial Lake Missoula flood deposits and related features of the Rathdrum Prairie, Tobacco Root Geological Society 26th Field Conference, Wallace, August (R.M. Breckenridge, V.S. Gillerman).

Field trip, Idaho Geological Survey STATEMAP project in the Clearwater corridor, May (B. Bonnichsen, R.M. Breckenridge, J.A. Freed, C.D. Fullerton, J.D. Kauffman, R.S. Lewis, V.E. Mitchell, K.L. Othberg, L.R. Stanford, R.C. Stewart, B.B.E. Studer, G.A. Wells, D.W. Weisz).

Field trip, Precambrian iron and zinc deposits of New York and New Jersey, Society of Economic Geologists, November (V.S. Gillerman).

Field trip, Seismic retrofit of the Carlyle Hotel, Spokane, Washington, January (R.M. Breckenridge).

- Field trip, Teacher workshop preview, Salmon Valley, June (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Field trip, Tour of the Clark Fork ice dam and Glacial Lake Missoula, Ice Age Floods Institute, Cloudsledge Foundation pilot study, Hope, September (R.M. Breckenridge).
- First Vice-Chair, Geological Society of America, Geoscience Education Division (T.C. Walker).
- Geological Society of America Annual Meeting, Boston, Massachusetts, November (R.S. Lewis, V.S. Gillerman).
- Geological Society of America, Cordilleran Section Meeting, Corvallis, Oregon, May (B. Bonnicksen, M.M. Godchaux, R.S. Lewis).
- Geological Society of America, Rocky Mountain Section Meeting, Cedar City, Utah, May (R.S. Lewis).
- Guest lecturer, Courses in environmental engineering, environmental geology, advanced physical geology, hydrogeology, Department of Geosciences, Idaho State University (J.A. Welhan).
- Idaho Association of Professional Geologists meetings, Boise (V.S. Gillerman).
- Idaho Environmental Forum meetings, Boise (V.S. Gillerman).
- Idaho Geological Survey Advisory Board teleconference meeting, Moscow, Boise, and Idaho Falls, December (B. Bonnicksen, R.M. Breckenridge, C.D. Fullerton, V.S. Gillerman, R.S. Lewis, V.E. Mitchell, K.L. Othberg, L.R. Stanford, T.C. Walker, J.A. Welhan, G.A. Wells).
- Idaho Geospatial Users meeting, Boise, December (L.R. Stanford).
- Idaho GIS User-Community, northern region meeting, Coeur d' Alene, August (L.R. Stanford, B.B.E. Studer).
- Idaho Earth Science Teachers Association business meeting, Montpelier, July (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Idaho Science Teachers Association and Idaho Earth Science Teachers Association annual conference, Idaho Falls, October (R.M. Breckenridge, V.S. Gillerman, K.L. Othberg, T.C. Walker).
- Idaho State Mapping Advisory Committee meeting, Boise, August (R.M. Breckenridge, K.L. Othberg).
- Idaho State Scenic Highway 200 Interpretive Project meetings, University of Idaho, Riverbend Park, Post Falls, March; Spokane County GIS, Spokane, Washington, May and June (R.M. Breckenridge).
- Instructor, Geosciences 606, Geostatistics and spatial modeling, Department of Geosciences, Idaho State University, January-May (J.A. Welhan).
- Instructors, Geology 504, Geology and geologic hazards, Bear Lake area, Department of Geological Sciences, University of Idaho, July (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Invited representative, President, Idaho Earth Science Teachers Association, Idaho Geological Survey Advisory Board teleconference meeting, Moscow, December (T.C. Walker).
- Joint California-Western States Post-Earthquake Technical Clearinghouse meeting, Sacramento California, October (R.M. Breckenridge).
- Leader, Field trip, Adams Elementary School, Boise, May (V.S. Gillerman).
- Leader, Field trip, Craters of the Moon National Monument, Idaho Science Teachers Association Convention, Idaho Falls, October (V.S. Gillerman).
- Leader, Field trips, Geology of Lewiston-Clarkston Valley, Sacajawea Junior High School, Lewiston, April; Lewiston High School, Lewiston, June (T.C. Walker).
- Leaders, Field trip, Friends of Rhyolite, southwest Idaho, May-June (B. Bonnicksen, M.M. Godchaux).
- Liaison, Idaho, National Earth Science Teachers Association, 2001-present (T.C. Walker).
- Member, Alpine Club of Canada (R.M. Breckenridge).
- Member, Association of Earth Science Editors (R.C. Stewart).
- Member, Basin and Range committee, Western States Seismic Policy Council (R.M. Brecken-



- ridge).
- Member, Earthquake Engineering Research Institute (R.M. Breckenridge).
- Member, Geological Society of Nevada (V.S. Gillerman).
- Member, Ground-water monitoring technical committee, Idaho Department of Environmental Quality (J.A. Welhan).
- Member, Ice Age Floods Institute (R.M. Breckenridge).
- Member, Ice Age Floods Task Force (R.M. Breckenridge).
- Member, International Association of Volcanology and Chemistry of the Earth's Interior (B. Bonnicksen).
- Member, National Science Teachers Association (T.C. Walker).
- Member, Northwest Scientific Association (K.L. Othberg).
- Member, Post-earthquake clearinghouse committee, Western States Seismic Policy Council (R.M. Breckenridge).
- Member, Science language technical team, North American Geologic Map Data Model Project (R.S. Lewis).
- Member, Seismological Society of America (R.M. Breckenridge).
- Member, Sigma Xi (V.S. Gillerman).
- Member, Society for Mining, Metallurgy, and Exploration (V.S. Gillerman).
- Member, Steering committee, North American Digital Geologic Map Data Model (L.R. Stanford).
- Member, Technical advisory committee, Blackfoot Storm-Water Master Plan (J.A. Welhan).
- Member, Technical advisory committee, Pocatello Storm-Water Master Plan (J.A. Welhan).
- Member, Technical committee, Treasure Valley Hydrologic Modeling Project (K.L. Othberg).
- Member, Washington Science Teachers Association (T.C. Walker).
- Member, Western States Seismic Policy Council (R.M. Breckenridge).
- Member and occasional chair, Ground Water Guardian, Portneuf Chapter (J.A. Welhan).
- Members, American Geophysical Union (T.C. Walker, J.A. Welhan).
- Members, American Quaternary Association (R.M. Breckenridge, K.L. Othberg).
- Members, EDMAP review board, Idaho Geological Survey (R.M. Breckenridge, K.L. Othberg).
- Members, Geological Society of America (E.H. Bennett, V.S. Gillerman, R.S. Lewis, V.E. Mitchell, K.L. Othberg, T.C. Walker, T.J. Williams).
- Members, Idaho Earth Science Teachers Association (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Members, National Earth Science Teachers Association (K.L. Othberg, T.C. Walker).
- Members, National Association of Geoscience Teachers (K.L. Othberg, T.C. Walker).
- Members, Northwest Mining Association (E.H. Bennett, V.S. Gillerman, R.S. Lewis).
- Members, Tobacco Root Geological Society (R.M. Breckenridge, R.S. Lewis).
- Mentor, Field Experience Program, Association of American State Geologists, July-October (K.L. Othberg).
- Non-Point Source Water Quality Monitoring Results Workshop, 12th annual workshop, Idaho Department of Environmental Quality and several other state and federal agencies, Boise, January (V.S. Gillerman).
- North American Digital Geologic Map Data Model steering committee meeting, Salt Lake City, Utah, May (L.R. Stanford).
- Northwest Mining Association 107th Annual Meeting, Spokane, Washington, December (E.H. Bennett, V.S. Gillerman, R.S. Lewis).
- President, Idaho Earth Science Teachers Association, October-June (T.C. Walker).
- President-Elect, Idaho Earth Science Teachers Association, July-September (T.C. Walker).
- Program chairman, Tobacco Root Geological Society 26th Field Conference, August (R.S. Lewis).
- Representative, Department of Geosciences, Boise State University (V.S. Gillerman).
- Representative, Department of Geosciences, Idaho State University (J.A. Welhan).
- Representative, Mining Advisory Committee,

Idaho Department of Lands (V.S. Gillerman).  
Representative, Graduate faculty, Idaho State University (J.A. Welhan).  
Representative, Water Planning Coordination Committee, Idaho Department of Water Resources (V.S. Gillerman).  
Representative, Technical Advisory Committee, Treasure Valley Hydrologic Project, Boise (V.S. Gillerman).  
Representative and disaster coordinator, Idaho Bureau of Disaster Services (V.S. Gillerman).  
Secretary, Board of Directors, The Belt Association (R.S. Lewis).  
Seismic Risk Communication, Western States Seismic Policy Council Annual Conference, Sacramento, California, October 21-24 (R.M. Breckenridge).  
Society of Economic Geologists Global Exploration 2002 Meeting, Denver, Colorado, April (V.S. Gillerman).  
State organizational meeting, Advanced National Seismic System, Idaho Bureau of Disaster Services, Boise, January (R.M. Breckenridge).  
Tobacco Root Geological Society 26th Field Conference, Wallace, August (E.H. Bennett, R.M. Breckenridge, R.F. Burmester, V.S. Gillerman, R.S. Lewis, W.L. Oakley).  
Treasure Valley Water Summit, Boise, January (V.S. Gillerman).  
Washington Science Teachers Association Fall Conference, Yakima, Washington (T.C. Walker).  
Western States Seismic Policy Council, Annual Business Meeting, Sacramento, California, October (R.M. Breckenridge).  
Workshop, Digital mapping techniques, Salt Lake City, Utah, May (J.S. Freed, K.L. Othberg, B.B.E. Studer, L.R. Stanford).  
Workshop, Snake River Plain petrogenesis, Department of Geosciences, Idaho State University, September (B. Bonnicksen, M.M. Godchaux).  
Workshop for Teachers, Geology and geologic hazards of Bear Lake area, Idaho, July (R.M. Breckenridge, K.L. Othberg, T.C. Walker).

## Award

Excellence in Support of Earth Science Education, Idaho Earth Science Teachers Association Award, Idaho Falls, October (V.S. Gillerman).

## Media Interviews, Appearances, and Articles

Appearance in *Rock and Minerals*, Idaho Public Television *Dialogue for Kids* series, April (V.S. Gillerman).  
*Formative Years*, by Peter B. Lewis, in *Horizon Air Magazine*, November, 2001, p. 37-45 (R.M. Breckenridge).  
*The Lower Portneuf River Aquifer: Issues, Concerns, and Opportunities*, Interview guest, *Your Public Works Show*, City of Pocatello Government Access Channel 11, January (J.A. Welhan).  
*The Lower Portneuf River Aquifer—It's at Your Feet and in Your Hands*, Interview guest, *The Rick Eicke Show*, City of Pocatello Public Access Channel 12, October (J.A. Welhan).  
*The Lower Portneuf River Aquifer*, Public information table placemat and brochure (released to Pocatello restaurants) produced by the lower Portneuf River Aquifer Protection Working Group, September (J.A. Welhan).

## Graduate Thesis Committees

Dean Garwood, M.S., Geology, University of Idaho (R.S. Lewis).  
Jacob Mundt, M.S., Geology, Idaho State University (J.A. Welhan).  
Joel Murray, M.S., Environmental Science, University of Idaho (K.L. Othberg).  
Andy Smith, M.S., Geology, Idaho State University (J.A. Welhan).  
Rachel Ellisor Teasdale, Ph.D., Geology, University of Idaho (B. Bonnicksen).

Adele Williams, Ph.D., Geology, University of Idaho (R.M. Breckenridge).

Susan Wilson, M.S., Geology, University of Idaho (R.S. Lewis).

## Grants and Contracts

*Arco Project Involving Digital Compilation of the Arco 30' by 60' Quadrangle, Idaho:* R.S. Lewis (U.S. Geological Survey, September 2001-August 2002, \$15,000).

*Basalt Mapping in the Glenwood 7.5' Quadrangle:* R.S. Lewis (Idaho Department of Lands, May 2002-March 2003, \$5,000).

*Basalt Mapping in the Weippe North 7.5' Quadrangle:* R.S. Lewis (Idaho Department of Lands, May 2001-March 2002, \$5,000).

*Boise National Forest Abandoned Mine Discovery:* E.H. Bennett, V.S. Gillerman, V.E. Mitchell (U.S. Forest Service, Region 4, \$102,842, June 2001-September 2002).

*Database of Abandoned/Inactive Mine Sites:* E.H. Bennett and V.E. Mitchell (U.S. Forest Service, Region 1, January 2001-December 2002, \$18,000).

*Digital Atlas of Idaho:* R.S. Lewis (Idaho State Board of Education, July 2001-June 2002, \$20,278).

*Geologic Hazards Curriculum Project:* T.C. Walker (Idaho EPSCoR grant, January 2001-May 2002, \$8,000).

*Geologic Mapping in the Brown Creek Ridge 7.5' Quadrangle:* R.S. Lewis (Potlatch Corporation, May 2002-March 2003, \$5,000).

*Headwaters Project Involving Digital Compilation of the Nez Perce Pass, Elk City, and Kooskia 30' by 60' Quadrangles, Idaho:* R.S. Lewis (U.S. Geological Survey, September 2001-August 2002, \$12,070).

*Investigation of Abandoned/Inactive Mine Sites:* V.S. Gillerman (Bureau of Land Management, December 2001-December 2002, \$30,000).

*Investigation of Abandoned/Inactive Mine Sites:* E.H. Bennett and V.E. Mitchell (U.S. Forest Service, Region 1, September 2001-September 2006, \$82,593).

*Mentored Field Experience Program:* K.L. Othberg (Association of American State Geologists, National Science Foundation, U.S. Geological Survey, June 2001-October 2001, \$3,300).

*Mitigation of Idaho Geologic Hazards, Earthquake Education Workshop:* R.M. Breckenridge and K.L. Othberg (Idaho Bureau of Disaster Services, 2002, \$50,000).

*Mitigation of Idaho Geologic Hazards, Earthquake Education Workshop:* R.M. Breckenridge and K.L. Othberg (Idaho Bureau of Disaster Services, March 2001-September 2001, \$50,000).

*STATEMAP Project, Geologic Mapping in the Sun Valley Urban Corridor, the Clearwater River Valley, and in the Murphy, Headquarters and Deadwood River 30' x 60' Quadrangles:* K.L. Othberg, R.M. Breckenridge, B. Bonnicksen, and R.S. Lewis (U.S. Geological Survey, May 2001-April 2002, \$208,450).

*STATEMAP Project, Geologic Mapping in the Sun Valley Urban Corridor, the Clearwater River Valley, the Kooskia 30' x 60' Quadrangle, and in Gooding, Jerome, and Twin Falls Counties:* K.L. Othberg, R.M. Breckenridge, R.S. Lewis, B. Bonnicksen, and V.S. Gillerman (U.S. Geological Survey, May 2002-April 2003, \$250,000).

*Statewide Ground-Water Quality Monitoring Kriging Analysis:* J.A. Welhan (Idaho Department of Water Resources, June 2002-July 2003, \$34,878).