

Staff Publications and Activities

Fiscal Year 1999

Publications

- Belt Rocks North of the Bitterroot Lobe of the Idaho Batholith: The Southwest Basin Margin*, by R.F. Burmester, R.S. Lewis, and E.H. Bennett, in R.B. Berg, ed., Belt Symposium III: Montana Bureau of Mines and Geology Special Publication 112, 1998, p. 145-156.
- Exploration in Idaho*, 1998, by V.S. Gillerman and E.H. Bennett: Mining Engineering, 1999, v. 51, no. 5, p. 69-72.
- Geologic Map of the Grand View-Bruneau Area, Owyhee County, Idaho: Digitally Compiled Version*, by M.D. Jenks, B. Bonnicksen, and M.M. Godchaux: Idaho Geological Survey Technical Report 98-1, 1998, scale 1:100,000.
- Geologic Map of the Walters Butte Quadrangle, Ada, Canyon, and Owyhee Counties, Idaho*, by B. Bonnicksen and M.M. Godchaux: Idaho Geological Survey Geologic Map 21, 1998, scale 1:24,000.
- Idaho—1998 Annual Activity Report*, by S. Weiser and R.M. Breckenridge, in WSSPC Twentieth Annual Conference Program Guide: Western States Seismic Policy Council, 1998, p. 41-42.
- Metasedimentary Rocks Between the Bitterroot and Atlanta Lobes of the Idaho Batholith and Their Relationship to the Belt Supergroup*, by R.S. Lewis, R.F. Burmester, and E.H. Bennett, in R.B. Berg, ed., Belt Symposium III: Montana Bureau of Mines and Geology Special Publication 112, 1998, p. 130-144.
- Mineral Industry of Idaho—1997*, by A. Tanner and J.R. Loebenstein, with V.S. Gillerman: U.S. Geological Survey Minerals Yearbook Chapter, 1998, v. II, p. 90-95.
- Surficial Geologic Map of Coeur d'Alene Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geologi-

cal Survey Surficial Geologic Map 7, 1999, scale 1:24,000.

- Surficial Geologic Map of Hayden Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey Surficial Geologic Map 8, 1999, scale 1:24,000.
- Thrifty and Common Sense: Ground-Water Protection vs. Remediation in the Lower Portneuf River Valley*, by J.A. Welhan: The Gem, Idaho Rural Water Association, no. 22, 1999, p. 11-12.
- A View of Moscow, Idaho*, by R.M. Breckenridge: Idaho Geological Survey color poster, 19" x 27", 1998.

Abstracts

- Assessing the Uncertainty of First Arrival Time of a Conservative Contaminant Migrating in the Snake River Plain Aquifer*, by E.L. Gego, G.S. Johnson, M. Hankins, and J.A. Welhan: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. 7.
- Basalt Surface Morphology as a Constraint in Stochastic Simulations of High-Conductivity Zones in the Snake River Plain Aquifer, Idaho*, by J.A. Welhan: Transactions, American Geophysical Union (EOS), v. 79, p. 243.
- Bedrock Depth and Morphology of the Rathdrum Prairie Aquifer, Idaho*, by G.W. Adema, K.F. Sprenke, and R.M. Breckenridge: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. A-1.
- Compilation Efforts and Stratigraphic Problems in the Belt Supergroup, Northern Idaho and Western Montana*, by R.S. Lewis and R.F. Burmester: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. 21.

- A Digital Geologic Map Data Model Designed for GIS Users*, by L.R. Stanford, K.L. Othberg, R.S. Lewis, and R.M. Breckenridge: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. A-57.
- Directional Transmissivity and Spatial Correlation Structure of High-Porosity Zones in a Fractured Basalt Aquifer*, by J.A. Welhan, J.M. Bukowski, A.H. Wylie, and M.R. Hankins: Geological Society of America Abstracts with Programs, 1999, v. 30, no. 7, p. 69.
- An Estimation of the Ground-Shaking Hazard Due to Seismically Induced Bedrock Motion in the Vicinity of Idaho Falls, Idaho*, by B.K. Peterson, G.W. Adema, and R.M. Breckenridge: Geological Society of America Abstracts with Programs, 1999, v. 31 no. 4, p. A-52.
- Geologic and Hydrologic Controls on Environmental Conditions at Inactive and Abandoned Mines in Idaho*, by V.S. Gillerman, V.E. Mitchell, and J.D. Kauffman, 1999, Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. A14.
- Impacts of Historic Mining in Idaho and Idaho's Program of Inactive and Abandoned Mine Hazard Assessment*, by V.S. Gillerman, E.H. Bennett, V.E. Mitchell, and J.D. Kauffman, 1999, Geological Society of America Abstracts with Programs, 1999, v. 31, no. 6, p. A57.
- Missoula Flood Virtual Field Trip for Earth Science Students Using Hyperstudio*, by T.C. Walker: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. A-60.
- Morphology of Basalt Lava Flows on the Eastern Snake River Plain: Geometry, Fractal Analysis and Simulation*, by K. Reeves, J.A. Welhan, C.N. Johannesen, and K.W. Bosworth: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. 53.
- Permeability of Preferential Ground-Water Flow Zones in Basalt and Implications for Stochastic Ground-Water Modeling*, by J.A. Welhan, A.H. Wylie, M. Hankins, E. Gego, and G. Johnson: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. 60.
- Petrology of Basalts in the Central Part of the Western Snake River Plain, Idaho*, by C.M. White, W.K. Hart, B. Bonnicksen, and D. Matthews: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. A-61.
- Pre-Late Wisconsin Glacial Lake Missoula Flood Deposits in the Latah Creek Valley, WA and Other Proximal Flood Deposits, Northern Washington and Idaho*, by S.E. Meyer, D.R. Gaylord, F.F. Foit, and R.M. Breckenridge: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 6, p. A-79.
- Regional Miocene Paleosols of the Columbia Plateau Embayments of Northern Idaho*, by P.A. McDaniel, K.L. Othberg, and R.M. Breckenridge: Soil Science Society of America Annual Meeting, Abstracts, 1998.
- Stochastic Modeling of Contaminant Transport in the Snake River Plain Aquifer*, by E.L. Gego, G.S. Johnson, and J.A. Welhan: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. 12.
- Stochastic Simulation of Preferential Ground-Water Flow Zones in a Layered Basalt Aquifer System*, by J.A. Welhan, E. Gego, G. Johnson, and T. Clemo: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. 60.
- The Use of Paleomagnetic Analysis to Discriminate Post-Depositional Deformation: An Example From Missoula Flood Deposits*, by R.M. Breckenridge, K.L. Othberg, D.W. Weisz, S.E. Meyer, and D.R. Gaylord: Geological Society of America Abstracts with Programs, 1999, v. 31, no. 4, p. A-5.

Reports and Presentations _____

- 1998 Idaho Mineral Development*, by V.S. Gillerman: Northwest Mining Association 104th Annual Meeting, Spokane, Washington, De-

- ember.
- Bedrock Depth and Morphology of the Rathdrum Prairie Aquifer, Idaho*, by G.W. Adema, K.F. Sprenke, and R.M. Breckenridge: Geological Society of America, Rocky Mountain Section Meeting, Pocatello, April.
- Earthquakes and Idaho Geology*, by V.S. Gillerman: Ada County Emergency Management Seismic Tremor Workshop, Boise, July.
- An Estimation of the Ground-Shaking Hazard Due to Seismically Induced Bedrock Motion in the Vicinity of Idaho Falls, Idaho*, by B.K. Peterson, G.W. Adema, and R.M. Breckenridge: Geological Society of America, Rocky Mountain Section Meeting, Pocatello, April.
- Expected Earthquake Shaking Hazard for Pocatello, Idaho*, by R.M. Breckenridge and B.K. Peterson: Western States Seismic Policy Council Annual Conference, Pasadena, California, October.
- Expected Earthquake Shaking in Pocatello, Idaho*, by B.K. Peterson, R.M. Breckenridge, and S. Weiser: Western States Seismic Policy Council Twentieth Annual Conference, Pasadena, California, poster display, 1998.
- Exploration for Mesothermal Gold Deposits, Kingdom of Saudi Arabia*, by R.S. Lewis: University of Idaho/Washington State University, geology seminar, Moscow, March.
- A Digital Geologic Map Data Model Designed for GIS Users*, by L.R. Stanford, K.L. Othberg, R.S. Lewis, and R.M. Breckenridge: Geological Society of America, Rocky Mountain Section Meeting, Pocatello, April.
- Geologic and Hydrologic Controls on Environmental Conditions at Inactive and Abandoned Mines in Idaho*, by V.S. Gillerman: Geological Society of America Rocky Mountain Section Meeting, Pocatello, April.
- Geologic Map of the Genesee Quadrangle, Latah and Nez Perce Counties, Idaho*, by J.H. Bush, K.L. Othberg, R.M. Breckenridge, and D.W. Weisz: Idaho Geological Survey unpublished map, April.
- Geologic Map of the Green Knob Quadrangle, Latah and Nez Perce Counties, Idaho*, by J.H. Bush, K.L. Othberg, R.M. Breckenridge, D.L. Garwood, G.N. Potter, and D.W. Weisz: Idaho Geological Survey unpublished map, April.
- Geologic Map of the Uniontown Quadrangle, Latah and Nez Perce Counties, Idaho*, by J.H. Bush, K.L. Othberg, R.M. Breckenridge, and D.W. Weisz: Idaho Geological Survey unpublished map, April.
- Geology of Idaho*, by K.L. Othberg: Hells Gate State Park Interpretive Program, Lewiston, July.
- Ground-Water Mass Balance and Flux Calculations*, by J.A. Welhan: Geology class, Idaho State University, Pocatello, September.
- Ground Water Protection in the Pocatello-Chubbuck-Ft. Hall Area: A Parallel Approach to the State Source Water Assessment Process*, by J.A. Welhan: Source water assessment advisory committee, Department of Environmental Quality, Boise, December.
- History of the Atlanta Mining Area, Elmore County, Idaho* by V.E. Mitchell: Idaho Geological Survey report, 1999, 218 p.
- History of the Coeur d'Alene Mining District*, by E.H. Bennett: Coeur d'Alene company investors, August.
- History of the Idaho Continental Mine, Boundary County, Idaho* by V.E. Mitchell: Idaho Geological Survey report, 1999, 112 p.
- Hydrology of the Lower Portneuf River Valley Aquifer*, by J.A. Welhan: Highway Pond Gravel Mining and Aquifer Protection Working Group, Pocatello, February.
- Idaho Earthquake Studies Report, 1998*, by R.M. Breckenridge, G.W. Adema, and B.K. Peterson: Idaho Bureau of Disaster Services report, July, 11 p.
- Idaho Mining, 1998*, by V.S. Gillerman: Society for Mining, Metallurgy, and Exploration, Boise Section, Boise, February; Idaho Association of Professional Geologists, Southwest Idaho Section, Boise, February.
- Idaho Geological Survey's Mines and Prospects Database*, by V.E. Mitchell: U.S. Army Corps

- of Engineers Abandoned Mine Lands Workshop, Salt Lake City, Utah, April.
- Idaho Landslide Inventory, Database for Idaho*, by R.M. Breckenridge and L.S. Stanford: Project Report for Idaho Bureau of Disaster Services, 1998, 11 p.
- Idaho Update*, by R.M. Breckenridge: EQ Quarterly, Western States Seismic Policy Council Newsletter, August.
- Impacts of Historic Mining in Idaho and Idaho's Program of Inactive and Abandoned Mine Hazard Assessment*, by V.S. Gillerman: Geological Society of America Cordilleran Section Meeting, Berkeley, California, June.
- Missoula Flood Virtual Field Trip for Earth Science Students Using Hyperstudio*, by T.C. Walker: Geological Society of America, Rocky Mountain Section Meeting, Pocatello, April.
- Modeling Geospatial Data*, by J.A. Welhan: 1999 Intermountain GIS Users Conference, Idaho Falls, April.
- Overview of the Geology in the St. Maries, Idaho, Area*, by R.S. Lewis: Idaho Department of Lands seminar and field trip, St. Maries, April.
- Petrology of Basalts in the Central Part of the Western Snake River Plain, Idaho*, by C.M. White, W.K. Hart, B. Bonnicksen, and D. Matthews: Geological Society of America, Rocky Mountain Section Meeting, Pocatello, April.
- Portneuf Aquifer Hydrology, Ground-Water Impacts, and Eco-relationships*, by J.A. Welhan: Biology class, Idaho State University, December.
- Portneuf Ground Water Forum's Role and Contribution to Aquifer Protection Efforts*, by J.A. Welhan: Pocatello City Council, Pocatello, November.
- Pre-Late Wisconsin Glacial Lake Missoula Flood Deposits in the Latah Creek Valley, WA and Other Proximal Flood Deposits, Northern Washington and Idaho*, by S.E. Meyer, D.R. Gaylord, F.F. Foit, and R.M. Breckenridge: Geological Society of America, Cordilleran Section Meeting, Berkeley, California, June.
- Progress Report on Geologic Mapping and Belt Stratigraphy of the St. Maries Quadrangle, Idaho*, by R.S. Lewis: Northwest Mining Association annual meeting, Belt Association session, Spokane, Washington, December.
- Regional Miocene Paleosols of the Columbia Plateau Embayments of Northern Idaho*, by P.A. McDaniel, K.L. Othberg, and R.M. Breckenridge: Soil Science Society of America Annual Meeting, Baltimore, Maryland, October.
- Response to the 1983 Borah Peak Earthquake*, by R.M. Breckenridge: Western States Seismic Policy Council, Earthquake Response Clearinghouse Committee, Pasadena, California, September.
- The RGI GIS Database Project*, by J.A. Welhan: Joint Pocatello-Bannock County meeting, Pocatello, July.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho On and Near U.S. Forest Service Lands (Region 4), Bureau of Land Management Properties: Mineral Hill and Camas Mining Districts, Hailey-Bellevue Area, Blaine County, Idaho*, by E.H. Bennett and V.E. Mitchell: Idaho Geological Survey unpublished report, 1998, 143 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Hailey-Bellevue Area: Croesus Gulch Area, Blaine County, Idaho*, by V.S. Gillerman and V.E. Mitchell: Idaho Geological Survey unpublished report, 1999, 41 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Hailey-Bellevue Area: Hailey Gold Belt, Hailey-Bellevue Area, Blaine County, Idaho*, by V.S. Gillerman: Idaho Geological Survey unpublished report, 1999, 94 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Idaho Panhandle National Forest: Volume IV: Prichard Creek and Eagle Creek Drainages [secondary properties]*, by J.

- Kauffman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, 1999, 200 p., 1 videotape.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Idaho Panhandle National Forest: Volume V (Section A): Coeur d'Alene River Drainage Surrounding the Coeur d'Alene Mining District (Excluding the Prichard Creek and Eagle Creek Drainages) [secondary properties]*, by J. Kauffman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, 1999, 250 p., 1 videotape.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Hailey-Bellevue Area: Colorado and Star Gulches, Blaine County, Idaho*, by V.E. Mitchell and V.S. Gillerman: Idaho Geological Survey unpublished report, 1999, 94 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Idaho Panhandle National Forest: Volume V (Section B): Coeur d'Alene River Drainage Surrounding the Coeur d'Alene Mining District (Excluding the Prichard Creek and Eagle Creek Drainages) [secondary properties]*, by J. Kauffman, E.H. Bennett, and V.E. Mitchell: Idaho Geological Survey unpublished report, 1999, 211 p., 1 videotape.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Idaho Panhandle National Forest: Volume I: Prichard Creek and Eagle Creek Drainages [major properties]* by E.H. Bennett and V.E. Mitchell: Idaho Geological Survey unpublished report, 1998, 281 p., 2 videotapes.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Hailey-Bellevue Area: Bunker Hill Area, Blaine County, Idaho*, by Victoria E. Mitchell and Virginia S. Gillerman: Idaho Geological Survey unpublished report, 1999, 46 p.
- Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Bureau of Land Management Property in the Hailey-Bellevue Area: Red Elephant Gulch, Blaine County, Idaho*, by V.E. Mitchell and V.S. Gillerman: Idaho Geological Survey unpublished report, 1999, 60 p.
- Solvent Contamination and Options in the Lower Portneuf River Valley Aquifer*, by J.A. Welhan: Pocatello City Council, Pocatello, January.
- Spatial Correlation Analysis of Aquifer Lithology and Permeability and Development of a Stochastic Ground-Water Model*, by J.A. Welhan: Idaho Water Resources Research Institute—Idaho Universities Consortium Test Area North Research Project, Task 3, Final Quarterly Progress Report, March, 43 p.
- Stable Isotope Geochemistry and Case Studies*, by J.A. Welhan: Geology class, Idaho State University, March.
- Stratigraphy and Structure of the Belt Supergroup*, by R.S. Lewis: National Association of Geological Teachers regional meeting, Spokane, Washington, June.
- Surficial Geologic Map of the Fernan Lake Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, April.
- Surficial Geologic Map of the Hayden Lake Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, April.
- Surficial Geologic Map of the Mica Bay Quadrangle, Kootenai County, Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, April.
- Survey of Idaho Landslide Activity*, 1998, by R.M. Breckenridge: American Association of State Geologists Landslide Survey I, unpublished report, November 6 p.
- Survey of Idaho Landslide Activity*, 1999, by R.M. Breckenridge: American Association of State Geologists Landslide Survey II, unpublished report, May 8 p.
- An Update of Digital Geologic Mapping Projects*

in the Region, by R.S. Lewis: Intermountain Forest Tree Nutrition Cooperative Annual Meeting, Moscow, April.

Update on Idaho's Industrial Mineral Operations, by V.S. Gillerman: 35th Forum on the Geology of Industrial Minerals, Salt Lake City, Utah, May.

The U.S. 95 Landslide, Bonners Ferry, Idaho, by R.M. Breckenridge and T. Howard: Report for Idaho Bureau of Disaster Services, 1998, 15 p.

The Use of Paleomagnetic Analysis to Discriminate Post-Depositional Deformation: An Example From Missoula Flood Deposits, by R.M. Breckenridge, K.L. Othberg, D.W. Weisz, S.E. Meyer, and D.R. Gaylord: Geological Society of America, Rocky Mountain Section Meeting, Pocatello, April.

Professional Activities _____

35th Forum on the Geology of Industrial Minerals, Salt Lake City, Utah, May (V.S. Gillerman).

Abandoned and inactive mines meeting, U.S. Army Corps of Engineers, Salt Lake City, Utah, September (E.H. Bennett).

Advisory board meeting, Idaho Geological Survey, Boise, December (staff).

Association of American State Geologists annual meeting, Fairbanks, Alaska, June (E.H. Bennett).

Budget presentation, Joint Finance-Appropriations Committee, February, Statehouse, Boise (E.H. Bennett).

Business meeting, Idaho Earth Science Teachers Association, Boise, October (R.M. Breckenridge, V.S. Gillerman, K.L. Othberg).

Chair, Highway Pond Gravel Mining and Aquifer Protection Working Group, Pocatello (J.A. Welhan).

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

Chair, Sampling and Monitoring Design Team subcommittee, Highway Pond Gravel Mining and Aquifer Protection Working Group, Pocatello (J.A. Welhan).

Committee chair (admissions) and councilor, Society of Economic Geologists (V.S. Gillerman).

Conference of State Legislators annual meeting, Las Vegas, Nevada, July (E.H. Bennett).

Congressional dinner, Idaho Mining Association, Washington, D.C., May (E.H. Bennett).

Convener and co-chair, session on Proterozoic rocks of Idaho and Montana, Geological Society of America, Pocatello, April (R.S. Lewis).

Convener, Symposium on Tectonic and Magmatic Evolution of the Snake River Plain, Geological Society of America, Rocky Mountain section meeting, Pocatello, April (B. Bonnicksen).

Delegate, state geology, Western States Seismic Policy Council (R.M. Breckenridge).

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

Directors, Workshop for Teachers, geology and geologic hazards of west-central Idaho, July (K.L. Othberg, R.M. Breckenridge).

Earth Science Week Proclamation ceremony, Office of Gov. Philip E. Batt, October (V.S. Gillerman, K.L. Othberg).

Exhibitor, Boise Gem and Mineral Show, Boise, February (V.S. Gillerman).

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

Fellows, Society of Economic Geologists (B. Bonnicksen, V.S. Gillerman).

Field trip, California Institute of Technology Earthquake Research Center and the San Gabriel fault, Western States Seismic Policy Council, September (R.M. Breckenridge).

Field trip, City of Clark Fork Flood Protection and Remediation, Idaho Bureau of Disaster Services, April (R.M. Breckenridge).

Field trip, Columbia River Basalts, Idaho Geological Survey and Washington Department of Natural Resources, Division of Geology, Spokane, Washington, December (R.M. Brecken-

- ridge, K.L. Othberg).
- Field trip, Economic geology and environmental issues at Mercury-Gold Deposits and the McLaughlin Gold Deposit, California Coast Ranges, Geological Society of America, June (V.S. Gillerman).
- Field trip, Ice age floods-Glacial Lake Missoula, Ice Age Floods Institute, Missoula, Montana, July (R.M. Breckenridge).
- Field trip, sand and gravel resources of Boise area and Idaho Department of Transportation testing laboratory, Idaho Earth Science Teachers Association annual meeting, Boise, October (R.M. Breckenridge, K.L. Othberg).
- Field trip, tectonics of the Brownlee Reservoir area, Hells Canyon, Oregon and Idaho, Oregon Department of Geology and Mineral Resources and Idaho Geological Survey, August (R.M. Breckenridge, K.L. Othberg).
- Field trip, Workshop for Teachers preview, Farragut State Park and Rathdrum Prairie, June (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Geological Society of America annual meeting, Rocky Mountain section, Pocatello, April (E.H. Bennett, R.M. Breckenridge, V.S. Gillerman, R.S. Lewis, K.L. Othberg, L.R. Stanford, T.C. Walker, D.W. Weisz).
- Geological Society of America Cordilleran section meeting, Berkeley, California, June (V.S. Gillerman).
- Host, class trip on topographic maps, Renaissance Charter School, Moscow, September (C.L. Chaney).
- Idaho Earth Science Teachers Association annual newsletter, July and June (K.L. Othberg, C.D. Fullerton, B.D. Fullerton).
- Idaho Earth Science Teachers Association planning meeting, McCall, November (K.L. Othberg).
- Idaho Earth Science Teachers Association winter meeting, Boise, March (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Idaho Science Teachers Association and Idaho Earth Science Teachers Association annual conferences, Boise, October (R.M. Breckenridge, V.S. Gillerman, K.L. Othberg).
- Instructional assistant, student project, paleomagnetism of soft sediments; paleomagnetism of a basalt, spring (D.W. Weisz).
- Instructor, Geology 405, earth science education issues and activities, University of Idaho, spring (T.C. Walker).
- Instructors, Geology 408, field methods for earth science education majors, University of Idaho, fall (K.L. Othberg, T.C. Walker).
- Instructor, Geology 421, ore deposits, Boise State University, spring, 1999 (V.S. Gillerman).
- Instructor, Geology 599, geostatistics and stochastic simulation, Idaho State University (J.A. Welhan).
- Instructor, gold panning procedures, Workshop for Teachers, July (D.W. Weisz).
- Instructors, Geology 504, geology and geologic hazards, west-central Idaho, July (R.M. Breckenridge, K.L. Othberg).
- Instructors, Workshop for Teachers, geology and geologic hazards of west-central Idaho, July (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Kamiah Project, Impact Planning Meetings, Boise, February; Kamiah, March (R.M. Breckenridge).
- Keynote address, Idaho Academy of Science, Coeur d'Alene, March (E.H. Bennett).
- Kootenai County Geographic Information Systems meeting, University of Idaho, November (R.M. Breckenridge, L.R. Stanford).
- Leader, field trip, Coeur d'Alene STATEMAP project area, June (R.M. Breckenridge).
- Leader, field trip, Geology 103, geology of the solar system, University of Idaho, April (R.M. Breckenridge).
- Leader, field trip, Geology 421, ore deposits, Nevada Gold Mines, Winnemucca, Nevada, April (V.S. Gillerman).
- Leader, field trip, Ross Elementary School, Kuna, Boise, May (V.S. Gillerman).
- Leader, field trip, Out of the Rock Workshop, DeLamar Mine, September (V.S. Gillerman).

- Leader, field trip, Workshop for Teachers, Rescue Mine, Warren, July (V.S. Gillerman).
- Leader, field trips, Coeur d'Alene valley, American Association of Petroleum Geologists, September; Coeur d'Alene Chamber of Commerce, October; North Idaho Chamber of Commerce legislative tour, November (E.H. Bennett).
- Leaders, field trip, Cascade Mountains, Five-College volcanology class, Oregon and Washington, July (B. Bonnicksen, M.M. Godchaux).
- Leaders, field trips, floods and landslides in the Little Salmon River canyon and faults of Long Valley, Earthquake Education Field Workshop, McCall, July (R.M. Breckenridge, K.L. Othberg).
- Liaison, Idaho, National Earth Science Teachers Association, 1988-present (K.L. Othberg).
- Member, Alpine Club of Canada (R.M. Breckenridge).
- Member, American Geophysical Union (J.A. Welhan).
- Member, Association of Earth Science Editors (R.C. Stewart).
- Member, Basin and Range committee, Western States Seismic Policy Council (R.M. Breckenridge).
- Member, commission on explosive volcanism, International Association of Volcanology and Chemistry of the Earth's Interior (B. Bonnicksen).
- Member (ex-officio), Hazardous Waste Management Council, Idaho State University (J.A. Welhan).
- Member, FACA Advisory Committee, National Cooperative Geologic Mapping Program, Washington, D.C., April (E.H. Bennett)
- Member, Geological Society of Nevada (V.S. Gillerman).
- Member, Ice Age Floods Institute (R.M. Breckenridge).
- Member, Idaho Bureau of Disaster Services State Emergency Response Team, Clark Fork Flood Meeting, Coeur d'Alene, March (R.M. Breckenridge).
- Member, Idaho Science Teachers Association (K.L. Othberg).
- Member, International Association of Volcanology and Chemistry of the Earth's Interior (B. Bonnicksen).
- Member, liaison committee, Association of American State Geologists, September-March (E.H. Bennett).
- Member, National Association of Geology Teachers (K.L. Othberg).
- Member, National Earth Science Teachers Association (K.L. Othberg).
- Member, Northwest Scientific Association (K.L. Othberg).
- Member, Pocatello-Chubbuck Ground Water Guardian Committee (J.A. Welhan).
- Member, Sigma Xi (V.S. Gillerman).
- Member, Society for Mining, Metallurgy, and Exploration, Inc. (V.S. Gillerman).
- Member, Society for Sedimentary Geology (V.E. Mitchell).
- Members, American Quaternary Association (R.M. Breckenridge, K.L. Othberg).
- Members, EDMAP review board, (R.M. Breckenridge, K.L. Othberg).
- Members, Geological Society of America (E.H. Bennett, B. Bonnicksen, V.S. Gillerman, R.S. Lewis, V.E. Mitchell, K.L. Othberg).
- Members, Idaho Earth Science Teachers Association (R.M. Breckenridge, K.L. Othberg, T.C. Walker).
- Members, Northwest Mining Association (E.H. Bennett, V.S. Gillerman, R.S. Lewis).
- Members, technical advisory committee, Treasure Valley Hydrologic Modeling Project (V.S. Gillerman, K.L. Othberg)
- Mentors, undergraduate program, Association of American State Geologists-National Science Foundation (R.L. Lewis, K.L. Othberg, R.M. Breckenridge).
- Northwest Scientific Association annual meeting, Olympia, Washington, March (K.L. Othberg).
- Northwest Mining Association 104th annual meeting, Spokane, Washington, December (E.H. Bennett, R.M. Breckenridge, C.L.

Chaney, C.D. Fullerton, V.S. Gillerman, R.S. Lewis, K.L. Othberg, L.R. Stanford).
Officer, Boise section, Society for Mining, Metallurgy, and Exploration, Inc. (V.S. Gillerman).
Presenter, Association of American State Geologists' Pick and Gavel Award to Sen. Larry E. Craig, Cosmos Club, March (E.H. Bennett).
President's leadership conference, University of Idaho, Moscow, September (E.H. Bennett, R.M. Breckenridge, K.L. Othberg).
Regional Cluster Meeting, U.S. Geological Survey-Western States, Association of American State Geologists, Pasadena, California, September (R.M. Breckenridge).
Registered geologist, Oregon Board of Geologists, (R.M. Breckenridge).
Representative and disaster coordinator, Idaho Bureau of Disaster Services (V.S. Gillerman).
Representative, Department of Geosciences, Boise State University (V.S. Gillerman).
Representative, Earthquake Engineering Research Institute (R.M. Breckenridge).
Representative, flood and hazard meetings. Idaho Bureau of Disaster Services (V.S. Gillerman).
Representative, graduate faculty, School of Graduate Studies, Idaho State University (J.A. Welhan).
Representative, mining advisory committee, Idaho Department of Lands (V.S. Gillerman).
Representative, Source water assessment advisory technical committee, Idaho Department of Environmental Quality (J.A. Welhan).
Representative, water planning coordination committee, Idaho Department of Water Resources (V.S. Gillerman).
Research manager, GIS/CAD mapping computer laboratory, Geology Department, Idaho State University (J.A. Welhan).
Reviewer, *Depositional Environments of the Birch Creek Local Fauna (Pliocene: Blancan), Owyhee County, Idaho* by Jonena Hearst in Papers on the Vertebrate Paleontology of Idaho Honoring John A. White, Volume 1: Idaho Museum of Natural History Occasional Paper 36, p. 56-93 (B. Bonnicksen).

Secretary, board of directors, Belt Association (R.S. Lewis)
Society for Mining, Metallurgy, and Exploration, Inc.(SME) Boise section meetings, monthly (V.S. Gillerman).
Technical advisor, ground-water technical issues, Division of Environmental Quality, Pocatello Office (J.A. Welhan).
Technical advisor, Ice Age Floods Institute (R.M. Breckenridge).
Technical advisor, mechanical engineering student project, University of Idaho, Boise Discovery Center (R.M. Breckenridge).
Technical liaison, Fort Hall Canyon county landfill, Bannock County commissioners (J.A. Welhan).
Technical liaison, municipal aquifer system, Pocatello and Chubbuck (J.A. Welhan).
Trustee, Northwest Mining Association (E.H. Bennett).
Trustee, Northwest Scientific Association, 1997-2000 (K.L. Othberg).
Vice-President, Boise section, Society for Mining, Metallurgy, and Exploration, Inc. (V.S. Gillerman).
Western States Seismic Policy Council annual meeting, Pasadena, California, October (R.M. Breckenridge).
Workshop for Teachers, geology and geologic hazards of west-central Idaho, July (R.M. Breckenridge, C.D. Fullerton, V.S. Gillerman, K.L. Othberg, T.C. Walker, and D.W. Weisz).

Interviews and Articles _____

Featured Partner in Idaho Earth Science: Roy Breckenridge, Idaho Geological Survey: Idaho Earth Science Teachers Association newsletter, July (R.M. Breckenridge).
The Shapes of Nature: Unfolding Sun Valley's Geological Heritage: Interview for the Sun Valley Guide, July (V.S. Gillerman).

Graduate Thesis Committees _____

Guy Adema, M.S., Geophysics, University of Idaho (R.M. Breckenridge).
David Bates, M.S., Geology, Idaho State University (J.A. Welhan).
Michelle Bishop, M.S., Geology, University of Idaho (R.S. Lewis).
Rachel Ellisor, M.S., Geology, University of Idaho (B. Bonnicksen).
Mason Estes, M.S., Geology, Idaho State University (J.A. Welhan).
Gwen Gerber, M.S., Geology, Idaho State University (J.A. Welhan).
John Glover, M.S., Geology, Idaho State University (J.A. Welhan).
Chad Johannesen, M.S., Geology, Idaho State University (J.A. Welhan).
John Kaser, M.S., Hazardous Waste Management, Idaho State University (J.A. Welhan).
Chris Meehan, M.S., Geology, Idaho State University (J.A. Welhan).
Scott Meyer, M.S., Geology, Washington State University (R.M. Breckenridge).
Lee Morse, M.S., Geology, Idaho State University (J.A. Welhan).
Terrance Osier, M.S., Geology, Idaho State University (J.A. Welhan).
Jerry Potter, M.S., Geology, University of Idaho (B. Bonnicksen).
Christina Russell, Ph.D., Geology, University of Idaho (B. Bonnicksen).
Scott Van Hoff, M.S., Geology, Idaho State University (J.A. Welhan).
Tom Walker, M.A.T., University of Idaho (K.L. Othberg).
Ron Warren, M.S., Environmental Science, University of Idaho (K.L. Othberg).
Doug Whitmire, M.S., Geology, Idaho State University (J.A. Welhan).
Cathryn Williamson, M.A., Anthropology, University of Idaho (K.L. Othberg).

Grants and Contracts _____

City of Kamiah project impact: R.M. Breckenridge (Idaho Bureau of Disaster Services, April-June 1999, \$2,000).
Earth System Science Digital Atlas of Southern Idaho: P.K. Link, S. Sommer, C. Peterson, J.A. Welhan, and K. Weber (Idaho State Board of Education, \$250,000, July 1998-June 2000).
Headwaters project involving geologic mapping and digital compilation of the St. Maries 30' by 60' quadrangle, Idaho: E.H. Bennett and R.S. Lewis (U.S. Geological Survey, June 1998-March 1999, \$43,000).
Idaho earthquake and fault studies, Earthquake Education Workshop: R.M. Breckenridge and K.L. Othberg (Idaho Bureau of Disaster Services, May 1998-April 1999, \$34,000).
Investigation of abandoned/inactive mine sites: E.H. Bennett (U.S. Forest Service, July 1998-June 1999, \$202,184).
Investigation of abandoned/inactive mine sites: E.H. Bennett (Environmental Protection Agency, May 1999-January 2001, \$17,719).
Investigation of abandoned/inactive mine sites: E.H. Bennett (Idaho Department of Lands, May 1999-January 2001, \$20,000).
Investigation of abandoned/inactive mine sites: V.S. Gillerman (U.S. Bureau of Land Management, October 1998-September 2000, \$20,000).
Landslide database design and GIS-compatible shaded relief map for Idaho: R.M. Breckenridge and L.S. Stanford (Idaho Bureau of Disaster Services, April 1999-June 1999 \$13,200).
Mitigation of Idaho geologic hazards, Earthquake Education Workshop: R.M. Breckenridge and K.L. Othberg (Idaho Bureau of Disaster Services, June 1999-March 2000, \$47,900).
Portneuf Valley GIS data project, phase 1: J.A. Welhan and K. Weber (City of Pocatello, June 1998-June 1999, \$30,000).
Spatial correlation analysis of aquifer lithology and permeability, and development of a stochastic ground-water flow and transport model:

Staff Publications & Activities—Fiscal Year 1999

- J.A. Welhan and G. Johnson (U.S. Department of Energy, September 1997-March 1999, \$300,000).
- STATEMAP project, urban geologic mapping in Kootenai County and the Moscow-Lewiston area: K.L. Othberg, R.M. Breckenridge, B. Bonnicksen (U.S. Geological Survey, May 1998-April 1999, \$90,115).
- STATEMAP project, urban geologic mapping in Kootenai County and the Moscow-Lewiston area, and digital compilation of the Coeur d'Alene 30' x 60' quadrangle: K.L. Othberg, R.M. Breckenridge, B. Bonnicksen, and R.S. Lewis (U.S. Geological Survey, May 1999-April 2000, \$108,265).
- Teacher curriculum plans from Earthquake Education Workshops: R.M. Breckenridge, K.L. Othberg, and T.C. Walker (Idaho Bureau of Disaster Services, April 1999-June 1999, \$3,500).