

# Annual Report Fiscal Year 2004

Idaho  
Geological  
Survey



**Annual Report  
of the  
Idaho  
Geological  
Survey**

**Fiscal Year 2004**



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# IDAHO

## GEOLOGICAL SURVEY

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SINCE 1919, SERVING THE STATE THROUGH GEOLOGIC RESEARCH

December 16, 2004

Dr. Charles R. Hatch, Vice President for Research  
University Research Office  
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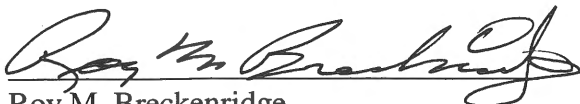
Dear Dr. Hatch:


We are pleased to submit the *Annual Report of the Idaho Geological Survey* for Fiscal Year 2004, as directed by Idaho Code, Section 47-201 through 47-204.

This marks the first year for the Idaho Geological Survey under the new enabling act that took effect July 1, 2003. The transition to administrative alignment with the Vice President of Research and the University Research Office has been accomplished in a smooth and efficient manner. We believe our operation within the university structure has improved while retaining the benefits of our academic relationships with Geological Sciences and other departments. Two geologist positions were filled during the year and we are benefitting from our increased production as shown by this document.

During FY 2004 the Annual Advisory Board meeting was moved to June. The change from December was welcomed by the members and invited guests and we plan to schedule the FY 2005 meeting for June. Action items in response to the comments and suggestions of the Board have been implemented, including graphical presentation of the budget in the Annual Report.

Sincerely,

  
Roy M. Breckenridge  
Director and State Geologist

  
Kurt L. Othberg  
Director





## Program Highlights—Fiscal Year 2004

The Idaho Geological Survey has a statewide mission as the lead agency collecting and disseminating geologic and mineral information for the state. 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. The staff handles numerous public inquiries and generates reports and presentations throughout the year (see Staff Publications and Activities).

**Annual Budget and Personnel.** Idaho again experienced budget difficulties during the past year, but with University-administration support the Survey filled two geology positions: a research faculty position opened through retirement and a senior geologist position expanded to full time during University realignment (see Budget and Personnel Trends chart). The budget cuts of the last several years have reduced the state-appropriated budget base and continue to change the way the Survey funds research, public service, and education. Fiscal Year-2003 saw a reorganization of the University of Idaho, a new enabling act for the Survey, and an administrative realignment of the Survey with the University Research Office under the Vice President for Research (see the FY-2003 Annual Report at [www.idahogeology.org](http://www.idahogeology.org)). The new enabling act took effect with the beginning of Fiscal Year-2004. The act internalized the director within the agency, and Kurt Othberg and Roy Breckenridge were appointed Directors; Breckenridge was also named State Geologist (see Organizational Chart).

**Geologic 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 areas of Idaho. During the year, geologists mapped sixteen 7.5-minute quadrangles. The Idaho Geologic Mapping Advisory Committee assists the agency by assessing Idaho's mapping needs and addressing long-term plans for geologic mapping. The Survey participates in the U.S. Geological Survey's STATEMAP program, which since 1990 has augmented geologic mapping in growth-, resource-, and development-impact areas. The Survey cooperates with several universities by endorsing EDMAP proposals for the U.S. Geological Survey's support of student geologic mapping in Idaho.

**Geologic Map Production.** The Survey's digital mapping and geographic information system (GIS) laboratory performs services ranging from digital cartography to spatial data management. The lab continues to compile geology around the state in a geologic map database in addition to the ongoing work of producing new geologic maps. Ten geologic maps were published this year. Most of these are available as print-on-demand color maps. All are available for free online.

The Survey completed the final phase of a geotechnical hazard assessment project for Clearwater and Nez Perce counties in cooperation with a geotechnical contractor. The mapping lab supplied the necessary digital mapping expertise to produce a GIS database of each county that will be used for planning, road building, and possible zoning purposes.

The Survey is a member of the North American Data Model Steering Committee, an inter-

agency organization that develops guidelines for designing computer-digitized legends of geologic maps. The Survey has created a new publication category, the Digital Geologic Map series, in which four new data sets were published during the year.

**Geologic Hazards.** As the state's population has grown and disaster losses have increased, the Survey devotes increasing amounts of time with geologic hazard mitigation. The agency works in close cooperation with the Idaho Bureau of Homeland Security 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. New surficial geologic maps are being applied in projects interpreting geologic hazards in Clearwater, Kootenai, and Nez Perce counties.

The Survey is a active member in the Western States Seismic Policy Council (WSSPC) and Pacific Northwest and Intermountain regional planning groups of the Advanced National Seismic System. Participation involves organizing seismic network operators and planning several hazard mitigation projects. The Survey is leading the efforts to organize a state seismic network clearinghouse capability based on the EARTHWORM system in cooperation with the Idaho Bureau of Homeland Security. The Survey and nearby basin-and-range states coordinate regional clearinghouse functions.

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. Teachers develop classroom activities for geologic-hazard education.

**Hydrogeology.** The Survey continues to work to better understand the geologic controls on ground-water flow and recharge and the distribution and transport of ground-water contaminants. Results of research are provided to end-users for ground-water resource development and protection. To accomplish this, the Survey cooperates with other state and federal agencies, university programs, and water-user groups throughout Idaho. Research includes the modeling of aquifer stratigraphy, data analysis and mapping of ground-water quality, and assessing ground-water vulnerability to septic sewage disposal through the mapping of surface geological and soils data and subsurface hydrogeology.

In collaboration with the USGS-Idaho National Laboratory Project Office, the Survey is conducting statistical analysis and three-dimensional stratigraphic modeling of sedimentary interbeds based on USGS well databases. This effort is in support of the USGS's development of a subregional-scale ground-water flow model and is also helping to advance basic geologic knowledge of the sedimentary and volcanic depositional setting of the eastern Snake River Plain.

The Survey is developing and applying novel spatial-temporal geostatistical techniques to analyze ground-water quality data and to improve the effectiveness of monitoring network sampling designs. The approach is an outgrowth of previous research performed for the Idaho Department of Water Resources and is being successfully applied in the analysis of other state ground-water monitoring databases. Statistically-based GIS tools are used to identify areas of water quality concern, to define temporal and spatial trends in water quality, and to rank problem areas.

In the greater Pocatello area, the Survey assists local jurisdictions in creating effective ways to protect and manage the lower Portneuf Valley ground-water resources. Methods developed include a GIS database for soils and related attributes for ranking suitability for septic-based development, aquifer vulnerability assessment, and educational components that include a Web site devoted to this program.

**Mining Activity.** The Survey maintains a working knowledge of the geology of all active mines in Idaho. Information and statistics on mines are collected and published annually. The Survey cooperates with the U.S. Geological Survey in collecting and interpreting mineral statistics and mining data, and presents an overview of Idaho's exploration and mining at the Northwest Mining Association's annual meeting. Summaries of Idaho's mining and exploration activity are published annually in the May issue of *Mining Engineering*, the U.S. Geological Survey's *Minerals Yearbook*, and the Idaho Department of Commerce's *Idaho Facts*. The current article in *Mining Engineering* is viewable on the Survey's Web site.

**Abandoned and Inactive Mines.** Since 1994, the Survey has been evaluating and inventorying abandoned and inactive mines in the state in cooperation with federal agencies. In FY-2004, work was conducted in cooperation with the U.S. Forest Service Region 4 and the U.S. Bureau of Land Management. The results identify physical as well as environmental hazards, and selected mine histories are recorded for possible future analysis and remediation. The petrologic and geochronological research on the Lemhi Pass thorium district arose out of a field visit on the AML program. A small contract was negotiated with the Idaho Department of Parks and Recreation for field exams of several large

mines on private property in the Bayhorse mining district near Challis.

**Mine Safety Training Program.** Since FY-2003, Idaho's Mine Safety Training Program has been a service component of the Survey. The program provides courses approved by the U.S. Department of Labor's, Mine Safety Health Administration (MSHA). Courses include new miner training, annual safety refreshers, and mine rescue training. The Survey's Mine Safety Trainer conducted twenty-seven training sessions during the year. The program has proved to be an important asset to the Survey.

**Outreach.** The Survey disseminates geologic and mineral data on Idaho primarily through its publications, Web site, in-house library collections, and various efforts in educating the public in the earth sciences.

**Publications.** Since 2000, the Survey has released more than 100 publications that include books, maps, reports, databases, posters, and fact sheets (see Idaho Geological Survey Publications for sales and revenue charts). This rate of output is over twice that of the previous decade, and now averages about 25 publications a year. Geologic maps and Staff Reports represent most of the increase: Ten geologic maps and twenty-three staff reports were published in FY-2004. The latest Bulletin, *Tectonic and Magmatic Evolution of the Snake River Plain Volcanic Province*, was published in the spring and was featured at the Survey's booth at the Geological Society of America meeting held in Boise during May. Access to publications is broadened through the agency's Web site.

**The Web site—[www.idahogeology.org](http://www.idahogeology.org).** The Survey's Web site provides electronic ac-

cess to geologic maps, GIS databases, and wide-ranging information such as geologic hazards and earth science education. Internet access to the research and services of the Survey continues to expand through added information, search engines, viewable PDF documents, and downloadable maps and documents. This year's additions to the Web site include a searchable version of the Idaho Survey's *Mines and Prospects* database and an online searchable GIS version the *Miocene and Younger Faults in Idaho*. There are now over 60 downloadable maps online. The Survey has begun to track use of the Web site (see Web Site Performance chart).

**Databases and Archives.** The Survey's databases include digital geologic maps, mines and prospects, and information on the state's earthquakes, faults, and landslides. Digital geologic databases and earthquake information are available on the Survey's Web site. At the Moscow office, the agency maintains statewide collections of reports on mines and graduate theses and dissertations on geology. The Survey recently completed a database and index to geologic maps. The digitized areal coverages of 614 thesis maps are included in the searchable database. These products complement the existing U.S. Geological Survey's index available on the Internet.

**Earth Science Education.** The Survey staff supports a variety of formal and informal geologic education efforts throughout the state, region, and 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

have also designed and implemented displays, handouts, and field trips for the Ice Age Floods Institute that highlight the ice-dam story of Glacial Lake Missoula in northern Idaho. A bill authorizing a National Ice Age Floods Geologic Trail in Montana, Idaho, Washington, and Oregon was introduced in Congress to be administered under the National Park Service. The state geologists of Montana, Idaho, Washington, and Oregon have formed an ad hoc advisory panel to track progress and provide input from the state surveys.

The Survey is primarily engaged in promoting earth science education with the state's teachers through its active role with the Idaho Earth Science Teachers Association, its Web site ([www.idahogeology.org](http://www.idahogeology.org)), and its field workshops conducted around the state so that they can observe the methods and science of geology in Idaho's own outdoor laboratory. The summer of 2003 marked the twenty-fourth workshop the Survey has conducted since 1986.

**Association of American State Geologists (AASG).** The Idaho Geological Survey continues to be active in the AASG. During FY-2003, Roy Breckenridge was named State Geologist and was formally recognized at the AASG annual meeting in June. Both Roy and Kurt Othberg participated in AASG's annual and midyear meetings. Breckenridge was selected by the other western state geologists to serve a three-year term as the regional representative on the U.S. Geological Survey's Peer-Review Panel for the STATEMAP component of the National Cooperative Geologic Mapping Act. He also was requested by Sen. Larry Craig's Subcommittee on Public Lands and Forests to provide testimony regarding reauthorization of the Mapping Act and its benefits to Idaho.

## Staff Publications and Activities

### Publications

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- Applying Surficial Geologic Mapping to Geologic Hazards Mapping, Nez Perce County, Idaho,* by L.R. Stanford, K.L. Othberg, B. Reynolds, and R.M. Breckenridge, in D.R. Soller, ed., *Digital Mapping Techniques '03 Workshop Proceedings:* U.S. Geological Survey Open-File Report 03-471, p. 235-236.
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- List of Publications, 2004,* by R.C. Stewart: Idaho Geological Survey booklet, 52 p.
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- Probability Mapping As a Decision Tool for Water Quality Monitoring*, by J.A. Welhan, M. Merrick, K. Neely, and E. Hagen: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 29.
- Quartz Diorite Plutonism Across the Orofino Segment of the Salmon River Suture Zone, Idaho: Implications for Magma Generation Across Island Arc Collision Zones*, by K.L. Schmidt, R.S. Lewis, J.S. Currin, C.A. Lucas, and R.L. Watkins: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 69.
- Spatial-Temporal Analysis of Ground-Water Quality Data: The Use of Multi-Dimensional Kriging*, by J.A. Welhan, K. Neely, and E. Hagen: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 32.
- Structural Preservation of Gold Deposits: Northwest-Trending Faults in the Boise Basin*, by D.E. Leppert and V.S. Gillerman: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 4.
- Surficial Geologic Map of the Wood River Valley Project Area, Idaho Geological Survey Statemap Program*, by R.M. Breckenridge, K.L. Othberg, and L.R. Stanford: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 21.
- Tertiary Granite and Granodiorite Suites of the Bitterroot Lobe of the Idaho Batholith*, by T.P.



- Frost and R.S. Lewis: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 69.
- U-Pb Dating of Plutons Along the Transfer Zone Between the Bitterroot and Priest River Metamorphic Core Complexes*, by R.F. Burmester, W.C. McClelland, and R.S. Lewis: Geological Society of America Abstracts with Programs, 2004, v. 36, no. 4, p. 72.
- The Use of 2- and 3-D Kriging to Prioritize Spatial and Temporal Water Quality Trends*, by J.A. Welhan, M. Merrick, K. Neeley, and E. Hagan: 14th Non-Point Source Water Quality Monitoring Workshop, Abstracts with Programs, Boise, January, 2004, p. 9-10.
- ## Reports and Presentations
- Abandoned Mine Awareness*, by M.J. Weaver: Stay Out, Stay Alive program, U.S. Bureau of Land Management, fourth and fifth grade classes, Osburn Elementary School, Osburn, and Russell Elementary School, Moscow, April and May.
- Annual Report of the Idaho Geological Survey, Fiscal Year 2003*: December.
- Bedrock and Surficial Geologic Mapping, Clearwater River Corridor Project of the Idaho Geological Survey's Statemap Program*, by J.D. Kauffman and K.L. Othberg: Geological Society of America, Boise, May.
- Characterizing the Geothermal Resource at Lava Hot Springs, Idaho*, by J.A. Welhan: Citizens' Working Committee on Resource Development, Lava Hot Springs, February.
- Detecting and Prioritizing Spatial-Temporal Trends in Ground-Water Quality*, by J.A. Welhan: Idaho Department of Agriculture, Ground Water Coordination Committee Meeting, Boise, March.
- Earthquakes in Idaho*, by R.M. Breckenridge, G.W. Adema, and D.W. Weisz: Idaho Bureau of Disaster Services, deliverable map, version 2003/09, CD, December.
- The Eastern Idaho Snake River Plain Aquifer System: Geology and Hydrology*, by J.A. Welhan: Guest lecture, Engineering Geology class, Idaho State University, November.
- Faults and Earthquake Epicenters in Idaho*, by R.M. Breckenridge: Western States Seismic Policy Council, poster session, Portland, Oregon, October.
- Geologic History of the Inland Northwest*, by R.S. Lewis: Inland Northwest Chapter, Society of American Foresters Annual Meeting, Sandpoint, March.
- Geologic Map of the Clark Fork Quadrangle, Bonner County, Idaho*, by R.F. Burmester, R.M. Breckenridge, R.S. Lewis, and M.D. McFadden: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Geologic Map of the Falls City Quadrangle, Jerome County, Idaho*, by J.D. Kauffman and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Geologic Map of the Hagerman Quadrangle, Gooding and Twin Falls Counties, Idaho*, by K.L. Othberg, V.S. Gillerman, and J.D. Kauffman: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Geologic Map of the Hope Quadrangle, Bonner County, Idaho*, by R.F. Burmester, R.M. Breckenridge, R.S. Lewis, and M.D. McFadden: Idaho Geological Survey unpublished map, scale 1:24,000.
- Geologic Map of the Scotchman Peak Quadrangle, Bonner County, Idaho*, by R.F. Burmester, R.M. Breckenridge, R.S. Lewis, and M.D. McFadden: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Geologic Map of the Shoshone Quadrangle, Lincoln County, Idaho*, by J.D. Kauffman and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000.
- Geologic Map of the Shoshone SW Quadrangle, Jerome and Lincoln Counties, Idaho*, by J.D. Kauffman and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000, April.
- Geologic Map of the Thousand Springs Quadrangle, Gooding and Twin Falls Counties, Idaho*, by V.S. Gillerman, J.D. Kauffman, and K.L. Othberg: Idaho Geological Survey unpublished map, scale

- 1:24,000, April.
- Geologic Map of the Tuttle Quadrangle, Gooding and Twin Falls Counties, Idaho*, by J.D. Kauffman, K.L. Othberg, and V.S. Gillerman: Idaho Geological Survey unpublished map, scale 1:24,000.
- Geology and Geologic Hazards of the Clearwater Mountains*, by R.M. Breckenridge and K. L. Othberg: Field Workshop for Teachers, Lowell, July.
- Geostatistical Analysis of Water Quality Data*, by J.A. Welhan: Presentations, project results, and technical workshop, Idaho Department of Water Resources Geostatistics Training Workshop, Boise, August.
- Geostatistical Modeling of 3D Spatial-Temporal Data*, by J.A. Welhan: Three-day technical presentation and computer lab for Workshop on Spatial-Temporal Statistics, Darling Marine Center, Maine, July.
- Glacial Geology and History of the Sawtooth Mountains and White Cloud Peaks Area*, by L.R. Stanford: Wild Idaho Conservation Conference field trip, Sawtooth Valley, May.
- Glacial Lake Missoula, Clark Fork Ice Dam and the Floods Outburst Area: Northern Idaho and Western Montana*, by N.B. Smyers and R.M. Breckenridge: Geological Society of America Annual Meeting field trip, November.
- Hydrogeology, Water Resources, and Management of the Lower Portneuf River Valley Aquifer*, by J.A. Welhan: Introductory Hydrogeology class, Idaho State University, January.
- Ice Age Floods Field Trip*, by Roy M. Breckenridge: Mentorn Productions, WGN Boston Public Television. August.
- Idaho*, by R.M. Breckenridge, in J.P. Bluemle, ed., *The State Geologists Journal*, 2003: Association of American State Geologists, v. LV, p. 24-26.
- The Idaho Digital Geologic Map Data Model: A Summary and the Status of New Geologic Mapping in Idaho*, by L.R. Stanford: Idaho Geospatial Committee, Boise, September.
- Idaho Mining and Exploration, 2003*, by V.S. Gillerman: Northwest Mining Association 109th Annual Meeting, Spokane, Washington, December.
- Mineral Deposits of the Lemhi Pass Area, Central Beaverhead Mountains, Eastern Idaho*, by V.S. Gillerman: Belt Symposium IV and Tobacco Root Geological Society Field Trip 10, Salmon, August.
- Miocene and Younger Faults and Earthquakes in Idaho—An Update*, by R.M. Breckenridge: Poster presentation, Basin and Range Conference, Reno, Nevada, May.
- Miocene and Younger Faults in Idaho*, by R.M. Breckenridge, R.S. Lewis, G.W. Adema, and D.W. Weisz: Idaho Geological Survey unpublished map, version 2003/11, for the Bureau of Disaster Services, CD, December.
- New Ages for Bellevue Formation—Implications for Quaternary Stratigraphy of the Wood River Valley, Idaho*, by R.M. Breckenridge, K.L. Othberg, and R.P. Esser: Geological Society of America, Seattle, November.
- New Publications and Idaho Geological Survey Activity Update*, by V.S. Gillerman: Department of Environmental Quality Groundwater Monitoring Technical Committee, Boise, January.
- Newly Identified Oligocene Alkali Volcanics Along the Eastern Margin of the Columbia Plateau, Latah and Surrounding Counties, Idaho*, by J.D. Kauffman, J.H. Bush, and R.S. Lewis: Geological Society of America Annual Meeting, Seattle, Washington, November.
- Overview of the Idaho Phosphate Industry*, by V.S. Gillerman: Western Phosphate Mining and Processing Conference, Pocatello, June.
- Preliminary Geologic Map of the Northeast Part of the Deadwood River 30 x 60 Minute Quadrangle, Idaho*, by L.R. Stanford: Friends of the Pleistocene, Rocky Mountain Cell, central Idaho field trip, Grandjean, September.
- Preliminary Shaded Relief Map Coeur d'Alene Lake Area*, by L.R. Stanford, version 2003/10, Idaho Geological Survey unpublished map for the Bureau of Disaster Services, CD, December.
- Progress in Mapping the Belt Supergroup in Idaho, 1997-2003*, by R.S. Lewis: Belt Symposium IV, Salmon, August.
- Progress Report on Geologic Mapping and Belt Stratigraphy of the Sandpoint Quadrangle, Idaho*, by R.S. Lewis: Belt Association session, Northwest Mining Association annual meeting, Spo-

kane, Washington, December.

*Proposed Guidelines for a Tiered System of Water Supply Planning Requirements for New Developments*, by J.A. Welhan: Bannock County water planning officials, Pocatello, November.

*Results of Well Interference Modeling, K & R Farms Well, Fort Hall Reservation*, by J.A. Welhan: Shoshone-Bannock Tribal Water Resources Commission, Fort Hall, September.

*Surgo-Derived Physical Properties for Evaluating Site Suitability in Septic Sewage Planning*, by J.A. Welhan: Greater Portneuf Water Resources Partnership, Pocatello, February.

*Status of Geologic Mapping and Digital Data at the Idaho Geological Survey*, by L.R. Stanford: Idaho GIS User Community, Northern Region meeting, Coeur d'Alene, September.

*Strategies to Bring Back Cartography to the Digital Mapping Techniques Workshops*, by J.S. Freed: Digital Mapping Techniques Workshop, Portland, Oregon, May.

*Subsurface Architecture Field Trip Guide*, by J.A. Welhan: Inland Northwest Research Alliance Subsurface Science Graduate Program, March.

*Surficial Geologic Map of the Lake Fork Quadrangle, Valley County Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000.

*Surficial Geologic Map of the McCall Quadrangle, Valley County Idaho*, by R.M. Breckenridge and K.L. Othberg: Idaho Geological Survey unpublished map, scale 1:24,000.

*Surficial Geologic Map of the Wood River Valley project area, Idaho Geological Survey Statemap Program*, by R.M. Breckenridge, K.L. Othberg, and L.R. Stanford: Geological Society of America meeting, Boise, May.

*Surficial Geology and Glacial History of the Western and Northern Sawtooth Mountains*, by L.R. Stanford: Friends of the Pleistocene, Rocky Mountain Cell, central Idaho field trip, Grandjean, September.

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

*Upper Columbia Basin Network*, by R.M. Breckenridge and L.R. Stanford: National Park Service Geologic Resource Evaluation Meeting, Moscow, March.

*The Use of 2- and 3-D Kriging to Prioritize Spatial and Temporal Water Quality Trends*, by J.A. Welhan: 14th Non-Point Source Water Quality Monitoring Workshop, Boise, January.

## Professional Activities

Advisory board meeting, Idaho Geological Survey, Boise, June (R.M. Breckenridge, V.S. Gillerman, R.S. Lewis, K.L. Othberg, C.D. Fullerton).

Association of American State Geologists, annual meeting, Stevenson, Washington, June (R.M. Breckenridge, K.L. Othberg).

Association of American State Geologists, Auditing Committee meeting, Stevenson, Washington, June (R.M. Breckenridge).

Association of American State Geologists, midyear meeting, Seattle, Washington, November (R.M. Breckenridge, K.L. Othberg).

Association of American State Geologists, Western Cluster meetings, Portland, Oregon, and Stevenson, Washington, October and June (R.M. Breckenridge).

Belt Symposium IV and Tobacco Root Geological Society, Salmon, August (V.S. Gillerman, R.S. Lewis).

Chair, Search Committee, Assistant Research Geologist position, Idaho Geological Survey, September-March (K.L. Othberg).

Chair, Search Committee, Senior Geologist position, Idaho Geological Survey, January-February (K.L. Othberg).

Chair, Pocatello's Portneuf Ground Water Forum (J.A. Welhan).

Co-coordinator, field trip, Inland Northwest Research Alliance graduate program, March (J.A. Welhan).

Co-instructor (Adjunct Professor), Economics 497, economics of natural resources seminar, Department of Economics, Boise State University,

- January-March (V.S. Gillerman).
- Co-supervisor, Digital Geologic Mapping Lab, Idaho Geological Survey-Department of Geosciences, Idaho State University (J.A. Welhan).
- Convener, teleconference meeting, Idaho-U.S. Array, EARTHSCOPE, February (R.M. Breckenridge).
- Delegate, Geoscience, Western States Seismic Policy Council, (R.M. Breckenridge).
- Discussion leader, Digital Mapping Techniques Workshop, Portland, Oregon, May (J.S. Freed).
- Discussion leader, graduate seminar, Inland Northwest Research Alliance, October (J.A. Welhan).
- Facilitator and technical presenter, Workshop on Spatial-Temporal Statistics, Darling Marine Center, Maine, July (J.A. Welhan).
- Field trip, central Idaho-Sawtooth Mountains, Friends of the Pleistocene, Rocky Mountain cell, September (L.R. Stanford).
- Field trip, high temperature rhyolites of Rogerson and Jarbidge areas, October (V.S. Gillerman with B. Bonnicksen).
- Field trip, preparation for Geological Society of America Annual Meeting field trip, May (R.M. Breckenridge).
- Field trip, preview of 2004 Field Workshop for Teachers, Cascade, June (R.M. Breckenridge, K.L. Othberg).
- Field trip, White River altered areas and Osceola mudflow, Society of Economic Geologists, Washington, November (V.S. Gillerman).
- Field Workshop for Teachers, Clearwater Mountains, Lowell, July (R.M. Breckenridge, K.L. Othberg, D.W. Weisz, G.A. Wells).
- Geological Society of America Annual Meeting, Seattle, Washington, November (R.M. Breckenridge, V.S. Gillerman, J.D. Kauffman, R.S. Lewis, K.L. Othberg, L.R. Stanford).
- Geological Society of America, Cordilleran and Rocky Mountain sections meeting, Boise, May (R.M. Breckenridge, J.S. Freed, V.S. Gillerman, J.D. Kauffman, R.S. Lewis, K.L. Othberg, L.R. Stanford, G.A. Wells).
- Geologic Mapping Advisory Committee (IGMAC), Idaho Geological Survey, Boise, September (R.M. Breckenridge, V.S. Gillerman, R.S. Lewis, K.L. Othberg).
- Geologic Mapping Advisory Committee teleconference, Idaho Geological Survey, Moscow and Boise, August (R.M. Breckenridge, K.L. Othberg).
- GIS Day Conference, University of Idaho, Moscow, November (L. R. Stanford).
- Guest lecturer, Engineering Geology, introductory hydrogeology classes, Idaho State University (J.A. Welhan).
- Idaho Association of Professional Geologists meetings, Boise (V.S. Gillerman).
- Idaho Digital Mapping meeting, Boise, May (R.M. Breckenridge).
- Idaho Earth Science Teachers Association and Idaho Science Teachers Association annual conference, Idaho Falls, October (R.M. Breckenridge, K.L. Othberg).
- Idaho Earth Science Teachers Association business meetings, Lowell and Idaho Falls, July and October (R.M. Breckenridge, K.L. Othberg).
- Idaho Earth Science Teachers Association, Steering Committee meeting, Moscow, November (R.M. Breckenridge, K.L. Othberg, G.A. Wells).
- Idaho Environmental Forum meetings, Boise, January and May (V.S. Gillerman).
- Idaho Geologic Mappers Luncheon, Boise, May (J.S. Freed, R.M. Breckenridge, K.L. Othberg, J.D. Kauffman, R.S. Lewis, V.S. Gillerman, J.A. Welhan).
- Idaho GIS User Community, Northern Region meeting, Coeur d'Alene, September (L.R. Stanford).
- Instructor, Geosciences 606, geostatistics and spatial modeling, Department of Geosciences, Idaho State University, spring semester (J.A. Welhan).
- Instructors, Geology 404 and 504, geology and geologic hazards of the Clearwater Mountains, Department of Geological Sciences, University of Idaho, July (R.M. Breckenridge, K.L. Othberg).
- Judge, International Mine Rescue Competition, Ferny, British Columbia, Canada, October (M.J. Weaver).
- Judge, Southwest Regional Mine Rescue Competition, Rock Springs, Wyoming, June (M.J. Weaver).
- Lead instructor, Central Mine Rescue, twenty-three

- underground mines in the western U.S., Osburn (M.J. Weaver).
- Leader, field trip, Glacial Lake Missoula and the Clark Fork Ice Dam: northern Idaho and western Montana, Glacial Lake Missoula Chapter: Ice Age Floods Institute, May (R.M. Breckenridge).
- Leader, field trip, Glacial Lake Missoula-Clark Fork ice dam and the floods outburst area, Geological Society of America Annual Meeting, November (R.M. Breckenridge).
- Leader, field trip 10, Belt Symposium IV and Tobacco Root Geological Society, Salmon, August (V.S. Gillerman).
- Member, Alpine Club of Canada (R.M. Breckenridge).
- Member, American Geophysical Union (J.A. Welhan).
- Member, American Quaternary Association (R.M. Breckenridge).
- Member, Association of American State Geologists (R.M. Breckenridge).
- Member, Association of American State Geologists, auditing committee (R.M. Breckenridge).
- Member, Association of Earth Science Editors (R.C. Stewart).
- Member, Basin and Range Committee, Western States Seismic Policy Council (R.M. Breckenridge).
- Member (lifetime), Certified Mine Safety Professional (M.J. Weaver).
- Member, Council and Program Committee, Society of Economic Geologists (V.S. Gillerman).
- Member, Ground-Water Monitoring Technical Committee, Idaho Department of Environmental Quality (J.A. Welhan).
- Member, National Association of Geology Teachers (K.L. Othberg).
- Member, Northwest Mining Association (R.S. Lewis).
- Member, Science Language Technical Team, North American Geologic Map Data Model (R.S. Lewis).
- Member, Seismological Society of America (R.M. Breckenridge).
- Member, Society of Economic Geologists (V.S. Gillerman).
- Member, Steering Committee, North American Digital Geologic Map Data Model (L.R. Stanford).
- Member, Storm Water Technical Advisory Committee, Pocatello (J.A. Welhan).
- Member, U.S. Mine Rescue Association (M.J. Weaver).
- Member and co-chair, Ground Water Guardian, Portneuf Chapter (J.A. Welhan).
- Member and co-facilitator, Greater Portneuf Water Resources Partnership Steering Committee (J.A. Welhan).
- Members, EDMAP Review Board, Idaho Geological Survey (R.M. Breckenridge, K.L. Othberg).
- Members, Geological Society of America (R.M. Breckenridge, V.S. Gillerman, R.S. Lewis, V.E. Mitchell, K.L. Othberg).
- Members, Idaho Earth Science Teachers Association (R.M. Breckenridge, K.L. Othberg, G.A. Wells).
- Members, Search Committee, Assistant Research Geologist position, Idaho Geological Survey, September-March (R.M. Breckenridge, V.S. Gillerman, R.S. Lewis, K.L. Othberg, J.A. Welhan).
- Members, Search Committee, Senior Geologist position, Idaho Geological Survey, January-February (R.M. Breckenridge, R.S. Lewis, K.L. Othberg).
- Members, Search Interviews, Director position, Idaho Water Resources Research Institute (R.M. Breckenridge, V.S. Gillerman).
- Members, Society for Mining, Metallurgy, and Exploration, Inc. (V.S. Gillerman, M.J. Weaver).
- Members, Steering Committee, Idaho Earth Science Teachers Association (R.M. Breckenridge, K.L. Othberg, G.A. Wells).
- Meetings, Departments of Geosciences, Boise State University and Idaho State University, Boise and Pocatello, October (R.M. Breckenridge, K.L. Othberg).
- Mine Safety Refresher Training, Bureau of Land Management, Boise, May (V.S. Gillerman).
- North American Digital Geologic Map Data Model, Steering Committee meetings, Seattle, Washington, and Portland, Oregon, November and May (L.R. Stanford).
- Northwest Mining Association 109th Annual Meet-

- ing, Spokane, Washington, December (V.S. Gillerman, R.S. Lewis, M.J. Weaver).
- Organizer, Idaho Geologic Mappers Luncheon, Boise, May (L.R. Stanford).
- Organizers, 2004 Field Workshop for Teachers, "Geology and Geologic Hazards of Long Valley," Cascade, May-June (R.M. Breckenridge, K.L. Othberg).
- Panelist, Intergovernmental Relations Discussion on Water Resource Management, Idaho State University, December (J.A. Welhan).
- Program organizer, Belt Symposium IV, Salmon, August (R.S. Lewis).
- Recertification, Abandoned Mine Rescue Specialist, Central Mine Rescue (M.J. Weaver).
- Representative, Department of Geosciences, Idaho State University (J.A. Welhan).
- Representative, Department of Geosciences, Boise State University (V.S. Gillerman).
- Representative, School of Graduate Studies, Idaho State University Graduate Faculty (J.A. Welhan).
- Representative, Western Region (2004-2007), STATEMAP Peer Review Panel, U.S. Geological Survey-Association of American State Geologists (R.M. Breckenridge).
- Secretary, Belt Association Board of Directors (R.S. Lewis).
- Society for Mining, Metallurgy, and Exploration, Inc., Boise Section meeting, January (V.S. Gillerman).
- Society of Economic Geologists, Council and Program Committee meetings, Seattle, Washington, November (V.S. Gillerman).
- Technical advisor, Bannock County water planning officials (J.A. Welhan).
- Technical advisor, land acquisition to protect ground-water resources, city of Pocatello (J.A. Welhan).
- Technical advisor, Shoshone-Bannock Tribes' Water Resources Department (J.A. Welhan).
- Technical presentations and workshop facilitator, Idaho Department of Water Resources Geostatistics Training Workshop, Boise, August (J.A. Welhan).
- Technical representative, Pocatello's Intergovernmental Water Advisory Group (J.A. Welhan).
- Western Phosphate Mining and Processing Conference, Pocatello, June (V.S. Gillerman).
- Western States Seismic Safety Policy Committee meeting, Portland, Oregon, October (R.M. Breckenridge).
- Workshop, Abandoned Mine Land Restoration, U.S. Bureau of Land Management, Boise, May (V.S. Gillerman).
- Workshop, ArcGIS, Geospatial Research Facility, Boise State University, Boise, July (V.S. Gillerman).
- Workshop, Digital Mapping Techniques, Portland, Oregon, May (J.S. Freed, K.L. Othberg, L.R. Stanford).
- Workshop, Geostatistics Training, Idaho Department of Water Resources, Boise, August (J.A. Welhan).
- Workshop, Upper Columbia Basin Network Geologic Resource Evaluation, National Park Service, Moscow, March (R.M. Breckenridge, L.R. Stanford).
- Workshop, 14th Non-Point Source Water Quality Monitoring interagency conference, Boise, January (V.S. Gillerman, J.A. Welhan).

## Media Interviews

- Earthquakes in Idaho*: KTVB news interview, Boise, December (V.S. Gillerman).
- Yellowstone Supervolcano*: KBCI-TV news interview, Boise, September and November (V.S. Gillerman).

## Graduate Thesis Committees

- Renee Farabaugh, Ph.D., Geosciences, Idaho State University (J.A. Welhan).
- John Lee, Ph.D., Biology, Idaho State University (J.A. Welhan).
- Tiisetso Masiane, M.S., Environmental Engineering, Idaho State University (J.A. Welhan).
- John Mazurek, M.S., Geosciences, Idaho State University (J.A. Welhan).
- Jason Pappani, M.S., Biology, Idaho State University (J.A. Welhan).

sity (J.A. Welhan).  
Tom Rackow, M.S., Environmental Engineering,  
Idaho State University (J.A. Welhan).  
Grant Sha, M.S., Geology, Washington State Univer-  
sity (R.S. Lewis).  
Adele Williams, Ph.D., Geology, University of Idaho  
(R.M. Breckenridge).

## Grants and Contracts

*Abandoned Inactive Mine Inventory:* R.S. Lewis  
(U.S. Forest Service, Region 1, September 2001-  
September 2006, \$82,593).  
*Geologic Mapping in the Prater Mountain 7.5'  
Quadrangle:* R.S. Lewis (Idaho Department of  
Lands, May 2003-April 2004, \$5,000).  
*Geostatistical Analysis of Sediment Architecture in  
the Big Lost River Volcanic Trough:* J.A. Welhan  
(U.S. Geological Survey, September 2003-August  
2004, \$70,000).  
*Idaho Geological Survey Support of Idaho Bureau of  
Land Management's Abandoned Mine Lands  
Program:* V.S. Gillerman (U.S. Bureau of Land  
Management, July 2003-December 2005,  
\$40,000).  
*Idaho Mine Safety Training Program:* M.J. Weaver  
(Mine Safety and Health Administration, October  
2002-September 2003, \$89,007).  
*Idaho Mine Safety Training Program:* M.J. Weaver  
(Mine Safety and Health Administration, October  
2003-September 2004, \$89,007; supplemental  
grant for vehicle, \$21,500).  
*Mine Site Database:* R.S. Lewis (U.S. Forest Ser-  
vice, Region 4, June 2003-December 2005,  
\$185,000).  
*Mitigation of Idaho Geologic Hazards, Earthquake  
Education Workshop:* R.M. Breckenridge and  
K.L. Othberg (Idaho Bureau of Disaster Services,  
May-December 2003, \$45,000).  
*Mitigation of Idaho Geologic Hazards, Earthquake  
Education Workshop:* R.M. Breckenridge and  
K.L. Othberg (Idaho Bureau of Disaster Services,  
May-September 2004, \$45,000).  
*Soil Properties Maps for GIS Analysis of Septic  
Suitability:* J.A. Welhan (Three Rivers Resource,  
Conservation and Development District,  
July-December 2003, \$18,600).  
*STATEMAP Project, Geologic Mapping in the Twin  
Falls, Orofino, McCall-Cascade, and Sandpoint  
Project Areas:* K.L. Othberg, R.M. Breckenridge,  
R.S. Lewis, and V.S. Gillerman (U.S. Geological  
Survey, May 2004-April 2005, \$220,375).  
*STATEMAP Project, Geologic Mapping in the U.S.  
95/SR 55 McCall-Cascade Impact Corridor and in  
the Twin Falls, Orofino, and Sandpoint 30' x 60'  
Quadrangles:* K.L. Othberg, R.M. Breckenridge,  
R.S. Lewis, and V.S. Gillerman (U.S. Geological  
Survey, May 2003-April 2004, \$225,000).  
*Statewide Ground-Water Quality Kriging Data  
Analysis, Second Phase:* J.A. Welhan (Idaho  
Department of Water Resources, July-December  
2003, \$12,000).

# IDAHO

## GEOLOGICAL SURVEY

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### Main Office at Moscow

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Moscow, ID 83844-3014  
208-885-7991 Fax 208-885-5826

### Branch Office at Boise

MS 1535  
Boise State University  
Boise, ID 83725-1535  
208-426-4002 Fax 208-426-4061

### Branch Office at Pocatello

Physical Science, Room 235  
Idaho State University  
MS 8072  
Pocatello, ID 83209-8072  
208-282-4254 Fax 208-282-4414

### Administrative and Support Staff

Roy M. Breckenridge	Director and State Geologist
Kurt L. Othberg	Director
Roger C. Stewart	Manager, Publications and Communications
Charlotte D. Fullerton	Management Assistant
Gayle A. Wells	Administrative Assistant
Connie W. Tillotson	Secretary, Pocatello

### Research Staff

Roy M. Breckenridge	Full Research Geologist
Virginia S. Gillerman	Associate Research Geologist, Boise
John D. Kauffman	Senior Geologist
Reed S. Lewis	Associate Research Geologist
Kurt L. Othberg	Full Research Geologist
Vacant	Assistant Research Geologist
Loudon R. Stanford	Manager, Digital Map and GIS Lab
Michael J. Weaver	Mine Safety Specialist, C.M.S.P.
John A. Welhan	Full Research Geologist, Pocatello

### Project Staff (full-time temporary and part-time)

Earl H. Bennett	Geologist	Victoria E. Mitchell	Research Support Scientist
Jesse S. Bird	Work Study	Rebekah L. Ostervold	Office Assistant
James L. Browne	Geologist	Erin A. Otto	Field Assistant, Boise
Russell F. Burmester	Geologist	Richard R. Penticoff	Database Assistant
John H. Bush	Geologist	Stella T. Rwiza	Data Entry
P. Ted Doughty	Geologist	Keegan L. Schmidt	Geologist
Ted W. Erdman	Geologist	Kerri C. Schorzman	Work Study
Jane S. Freed	Cartographer	Kenneth F. Sprenke	Geologist
Dean L. Garwood	Geology Assistant	Ryan J. Stevens	Work Study
Robert G. Lee	Geology Assistant	B. Benjamin E. Studer	Cartographer
David L. Leppert	Field Assistant, Boise	Daniel W. Weisz	Geologic Aide
Mark D. McFadden	Geologist		

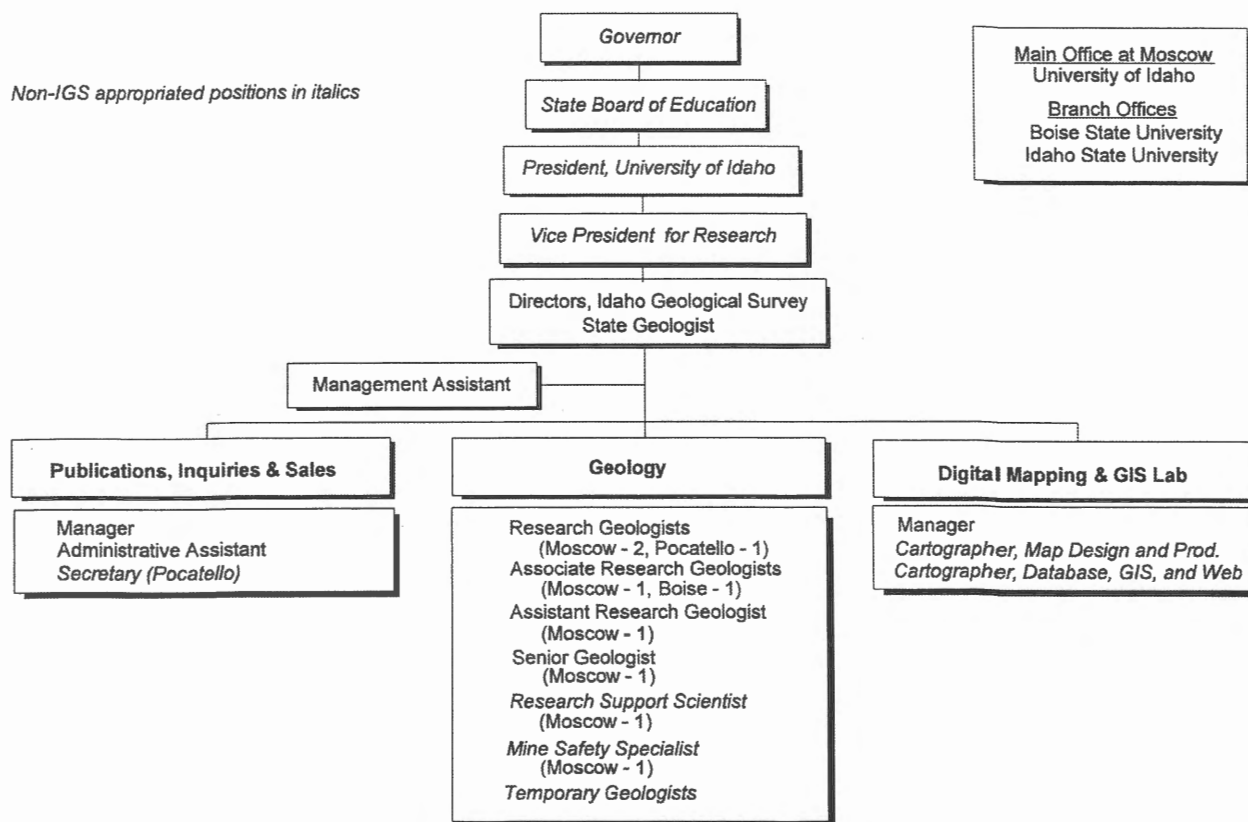


# ORGANIZATIONAL CHART

June, 2004

## IDAHO GEOLOGICAL SURVEY

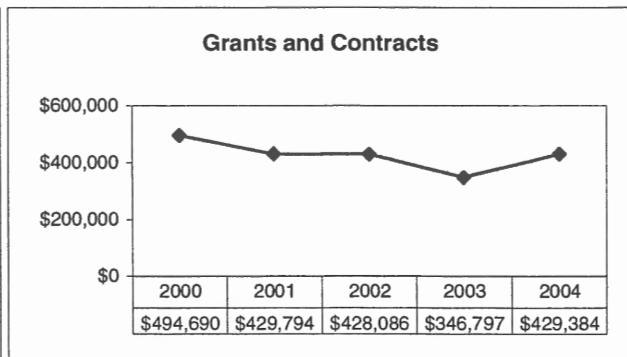
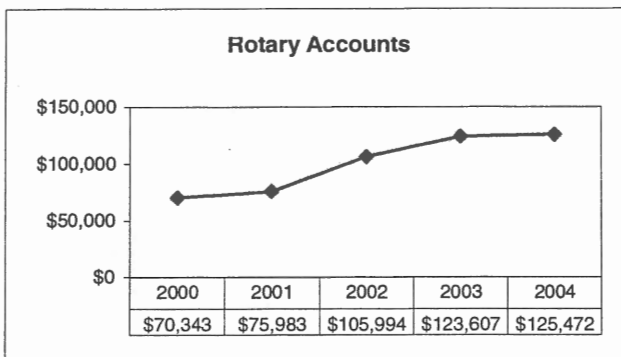
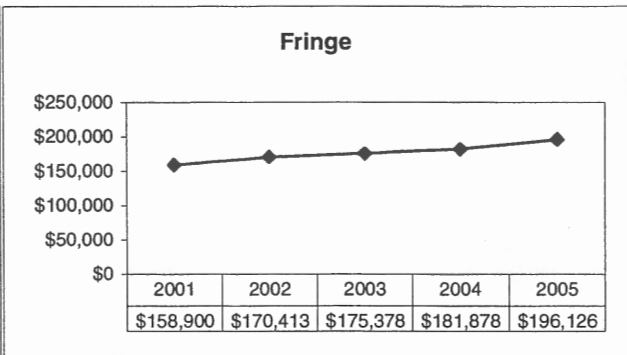
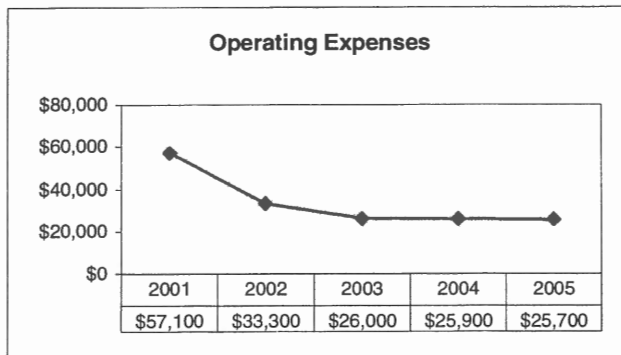
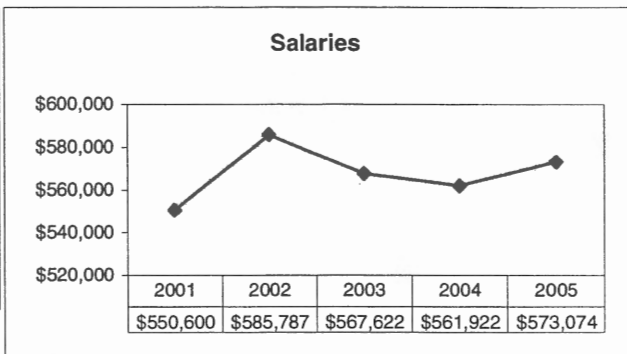
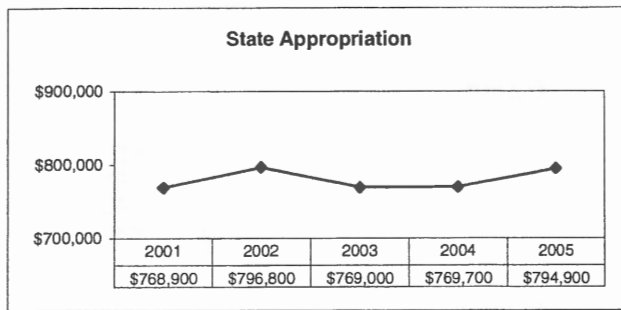
*Non-IGS appropriated positions in italics*



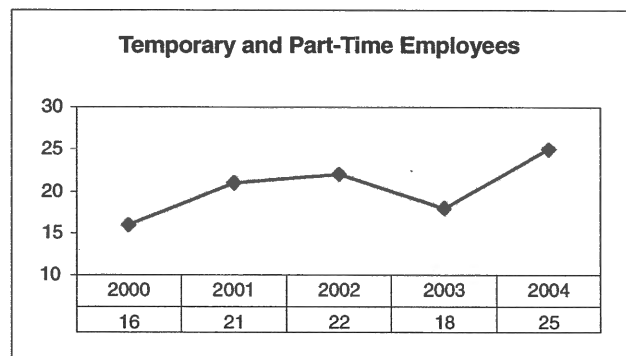
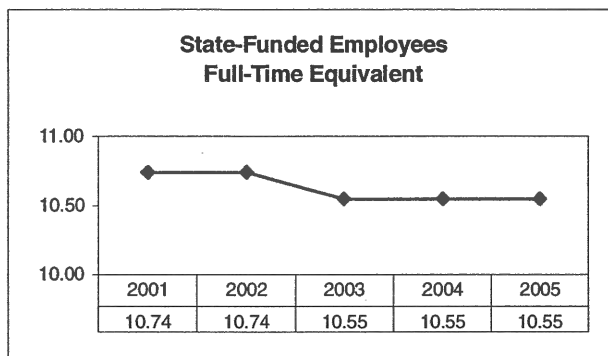
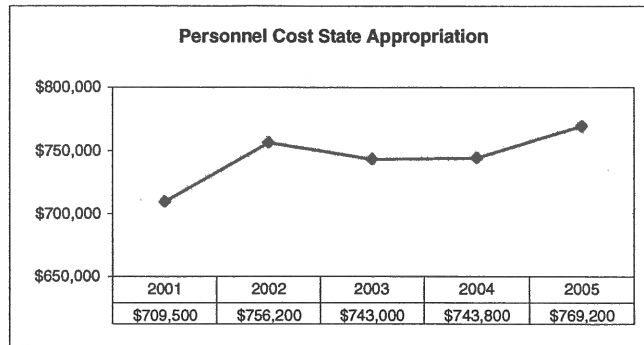
# FY-2004 Budget

	FY03			FY05	
	Carryover	Income	Expenses	Carryover	Balance
<b>Appropriation</b>					
Personnel	0	743,800	743,800	0	0
Operating Expenses	0	25,900	25,900	0	0
Total	0	769,500	769,500	0	0
<b>Rotary Accounts*</b>	123,607	120,064	118,199	125,472	0
<b>Grants and Contracts</b>	na	429,384	429,384	na	na
<b>Total</b>	123,607	2,088,648	2,086,783	125,472	0

\*Analyses, Boise branch office, digital map lab, earned overhead, earth-science education, literature collections, motor pool, MSHAW, and publications.

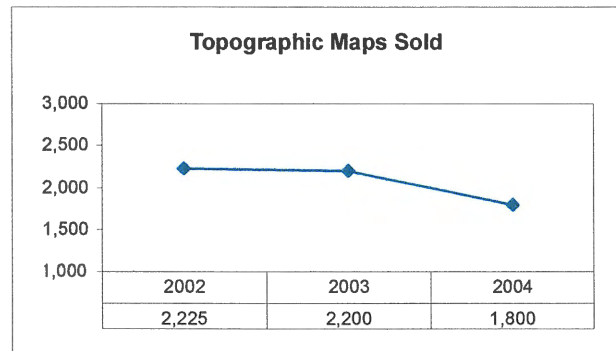
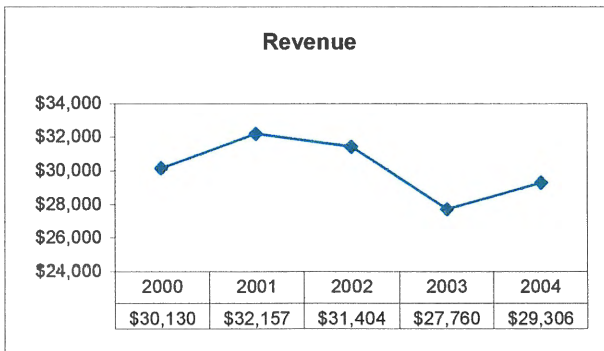
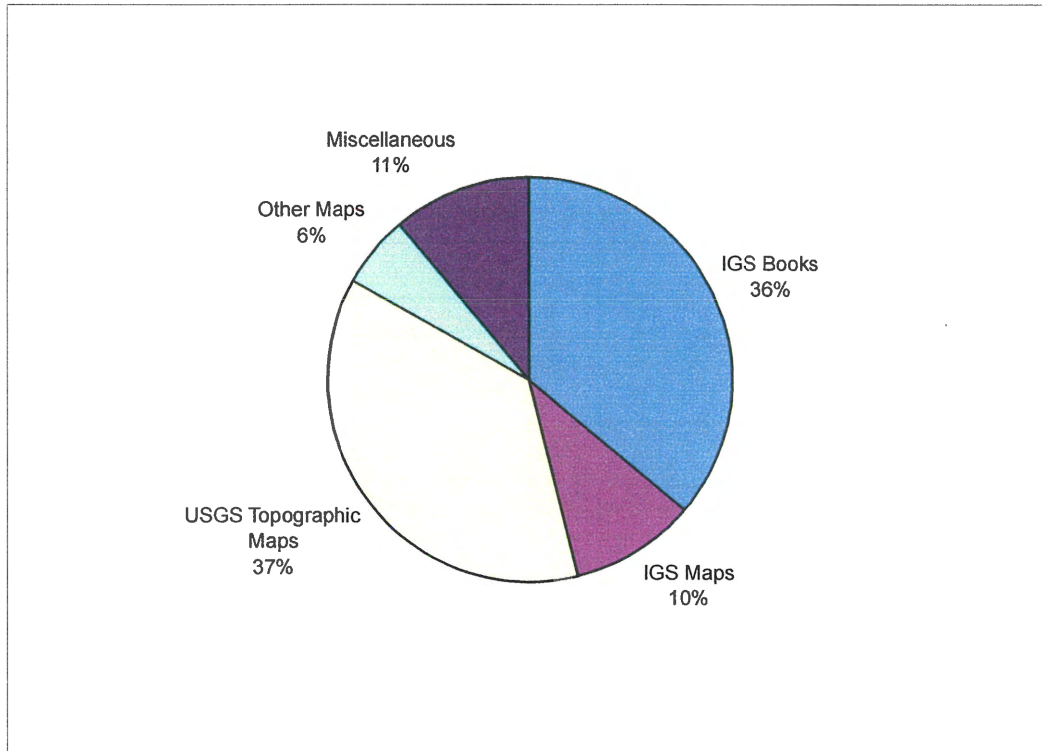


# Personnel Trends



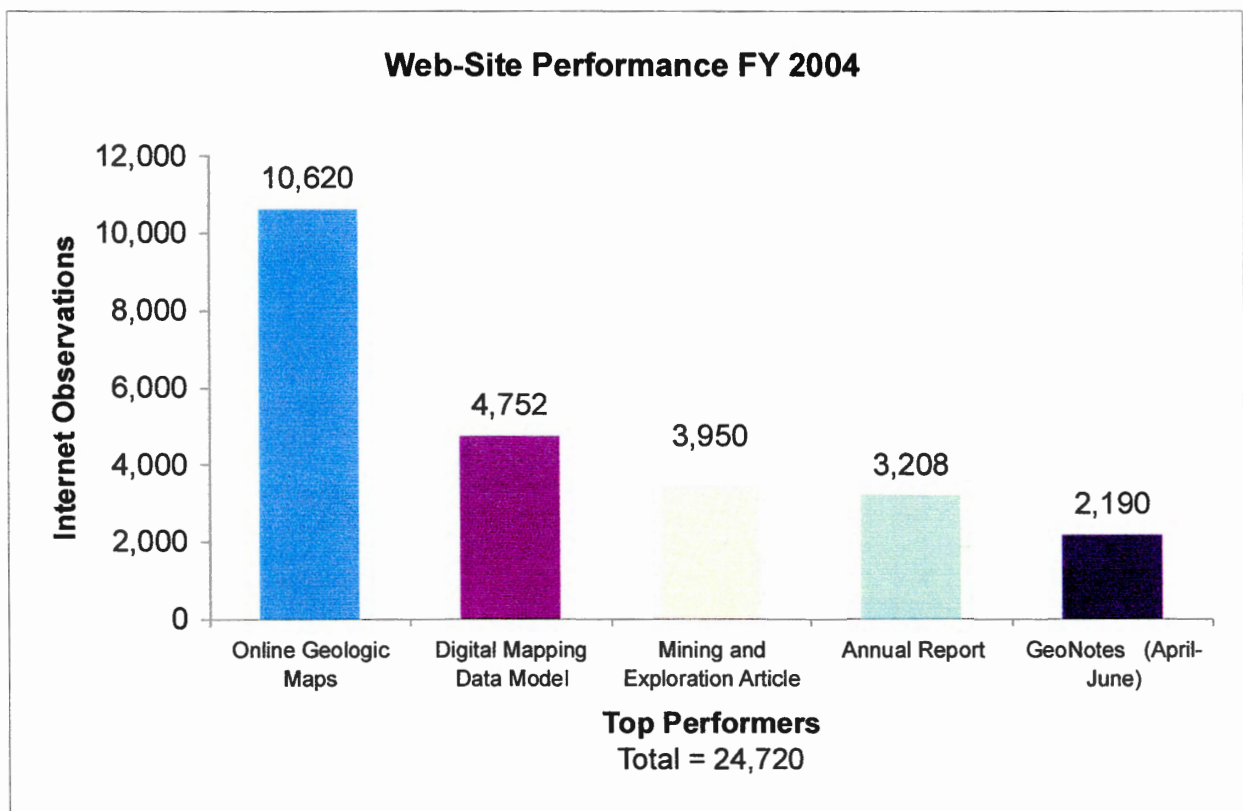
# Idaho Geological Survey Publications

## FY 2004 Sales



The U.S. Geological Survey plans to discontinue production of printed topographic maps in the near future.

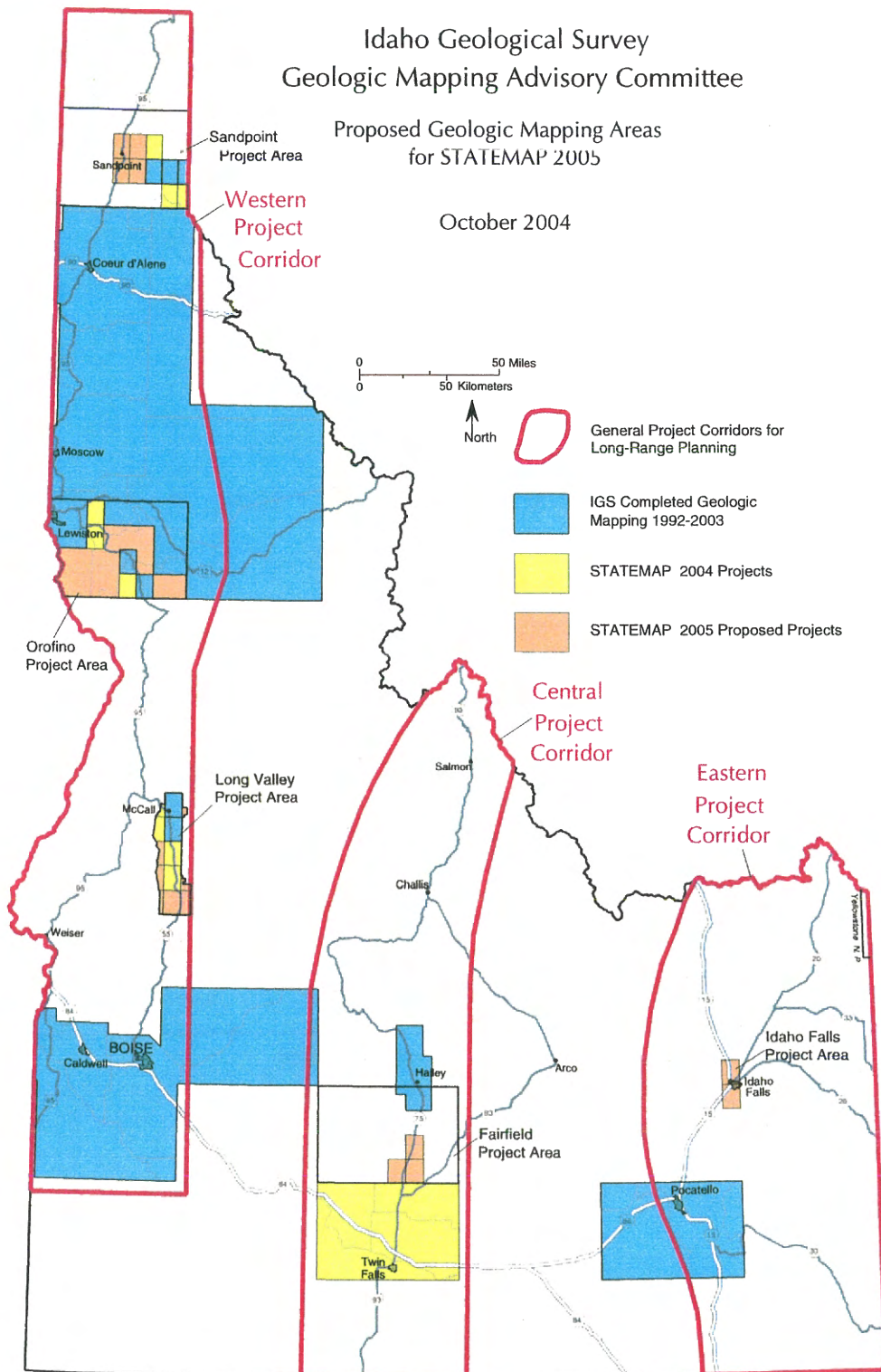
**Idaho Geological Survey Web Site**  
**www.idahogeology.org**



# Idaho Geological Survey Geologic Mapping Advisory Committee

## Proposed Geologic Mapping Areas for STATEMAP 2005

October 2004



# **IDAHO GEOLOGICAL MAPPING ADVISORY COMMITTEE**

interagency input to Idaho Geological Survey mapping initiatives

Maggie Colwell, Policy Analyst, Idaho Association of Counties ■ mcolwell@idcounties.org  
Liza Fox, Chief Technology Officer, Idaho Transportation Department ■ Liza.Fox@itd.idaho.gov  
Jerome Mapp, President, Idaho Planning Association ■ mmapp@cableone.net  
Steve Moore, Geologist, U.S. Bureau of Land Management ■ steve\_moore@blm.gov  
Jonathan Perry, Chair, Idaho Geospatial Mapping Committee ■ jperry@bhs.idaho.gov  
John Tracy, Director, Idaho Water Resources Research Institute ■ tracy@uidaho.edu  
Stephen Weiser, Plans and Mitigation Programs Manager, Idaho Bureau of Homeland Security ■ sweiser@bhs.idaho.gov

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October 25, 2004

STATEMAP 2005 Proposal Evaluation Committee  
National Cooperative Geologic Mapping Program  
U.S. Geological Survey  
12201 Sunrise Valley Drive  
Reston, Virginia 20192

The Idaho Geologic Mapping Advisory Committee (IGMAC) has reviewed the Idaho Geological Survey's proposed mapping projects for the STATEMAP 2005 submission, and endorses them without reservation. We find the projects consistent with the long range mapping objectives developed by this committee, namely to focus on existing and developing urban areas and critical transportation routes in the State of Idaho. The long-range planning project corridors map is Figure 2 in the Idaho Geological Survey proposal. The prioritization process is based on state mapping needs established by this IGMAC through questionnaires and group discussions, balanced with the Idaho Survey's resources, other cooperative funding, and current STATEMAP areas.

In the Western Project Corridor two mapping projects are proposed for completion and one will continue STATEMAP 2004 in the US 95 corridor, which is the only transportation route linking north and south Idaho and includes areas under heavy development pressures for which surficial mapping is needed to mitigate land-failure, avalanche, runoff, and water-table hazards. We find these especially important projects since they address both objectives.

A new proposed project, Fairfield, in the Central Project Corridor will extend mapping on the heavily-trafficked State Route 75 between the spreading urbanization of Sun Valley (STATEMAP 2003 project completion) and Twin Falls (STATEMAP 2004 project completion).

A new proposed project, Idaho Falls, is in the Eastern Project Corridor. Idaho Falls is the state's fourth largest city and has grown 15% in the last decade. It is also a nexus of the transportation routes in the corridor. Mapping this area will benefit development planning, water issues, and a

**Idaho Bureau of Homeland Security**

4040 Guard Street ■ Boise, Idaho 83705-5004 ■ 208-334-3460 ext 329

## Idaho Geological Mapping Advisory Committee

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— Page 2 —

previous seismic shaking study. We are pleased to see this project in the Idaho Geological Survey proposal, since it answers a concern identified in an IGMAC 2003 planning meeting.

For 2004, the long-range plan has not changed. The committee has met through email exchanges beginning in June and via two teleconferences ending in October. All committee members participated. It has taken input from the following sectors: cities and counties, land-use management, emergency management and geologic-hazards mitigation, water resources, transportation, geographic information systems, and economic geology and mineral resources. The IGMAC chairman presented an overview of the committee's activities at the annual meeting of the Idaho Geological Survey's Advisory Board on June 2. Commentary from board members and guests supported the IGMAC goals and indicated interest in mapping areas with known or suspected mineral resources, since low market prices have caused a drop in mapping and exploration by mining and minerals companies.

The committee is also moving to facilitate input from a wider audience. This will include a presence on the Idaho Geological Survey website (at [idahogeology.org](http://idahogeology.org)) with a listserve and an online geologic-map needs questionnaire.

Sincerely,

A handwritten signature in black ink, appearing to read 'Stephen Weiser', with a stylized flourish at the end.

Stephen Weiser  
Chair



<b>Overview of Grants and Contracts—FY04</b>			
<b>Project Title</b>	<b>Funding Agency</b>	<b>Date</b>	<b>Amount</b>
Basalt Mapping in the Prater Mountain	Idaho Department of Lands	May 2003– May 2004	\$5,000
Boise National Forest Abandoned Mine Discovery (Atlanta)	U.S. Department of Agriculture, Forest Service, Region 4	July 2001– December 2003	\$8,833
Database of Abandoned/Inactive Mine Sites	U.S. Department of Agriculture, Forest Service Region 4	January 2001– December 2003	\$18,000
Investigation of Abandoned/Inactive Mine Sites	U.S. Department of Agriculture, Forest Service Region 1	September 2001– September 2006	\$82,593
Investigation of Abandoned Mine Lands	USDI-Bureau of Land Management	July 2003– December 2005	\$40,000
Mine Safety Health Administration Consultation and Training	U.S. Department of Labor	October 2002– September 2003	\$29,994
Mine Site Lands Database	U.S. Department of Agriculture, Forest Service Region 4	June 2003– December 2005	\$185,000
Mine Safety Health Administration Consultation and Training	U.S. Department of Labor	October 2003–	\$89,007
Mitigation of Idaho Geologic Hazards, Earthquake Education Workshop	Idaho Bureau of Disaster Services	May 2003– November 2003	\$45,000
Mitigation of Idaho Geologic Hazards, Earthquake Education Workshop	Idaho Bureau of Disaster Services	May 2004– October 2004	\$45,000
STATEMAP Project, Geologic Mapping in the McCall, Orofino, Sandpoint, and Twin Falls Areas	U.S. Geological Survey	May 2003– April 2004	\$225,000
STATEMAP Project, Geologic Mapping in the McCall-Cascade, Orofino, Sandpoint, and Twin Falls Areas	U.S. Geological Survey	May 2004– April 2005	\$220,375
Statewide Ground-Water Quality Monitoring Kriging Analysis	Idaho Department of Water Resources	June 2002– July 2003	\$34,878

**Advisory Board Members  
Idaho Geological Survey  
Fiscal Year 2004**

**Dennis Geist**

Chair, Geological Sciences  
College of Science  
MIN 322  
University of Idaho  
Moscow, ID 83844-3025

**David Hawk**

(Representative, Office of the Governor)  
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Boise, ID 83707

**Scott Hughes**

Chair, Department of Geosciences  
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Pocatello, ID 83209

**Jack Lyman**

Executive Director  
Idaho Mining Association  
802 West Bannock, Suite 301  
Boise, ID 83702

**M. Jerome Mapp**

(Member-at-Large)  
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Boise, ID 83712

**C.J. Northrup**

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1910 University Drive  
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**Stephen Weiser**

(Member-at-Large)  
Assistant Deputy Director, Mitigation  
Idaho Bureau of Disaster Services  
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Boise, ID 83705-5004

**Winston Wiggins**

Director, Idaho Department of Lands  
954 W. Jefferson  
Boise, ID 83720

**Vacant**

(Representative, Idaho Association of  
Professional Geologists)

# The Idaho Geological Survey's Nineteenth Annual Advisory Board Meeting June 2, 2004

Minutes by Charlotte Fullerton

## INTRODUCTION

The nineteenth annual Advisory Board meeting of the Idaho Geological Survey was held on June 2, 2004, in the Alexander Room of the Student Union Building at Boise State University. The meeting was called to order at 8:30 a.m. Kurt Othberg and Roy Breckenridge offered their welcome and appreciation to Advisory Board members, guests, and staff. Newly appointed board members were introduced: Dennis Geist, representing the University of Idaho's Department of Geological Sciences and Stephen Weiser and M. Jerome Mapp, the two members-at-large.

The following Advisory Board members, or their representatives, were present: **Dennis Geist** (Chair, Department of Geological Sciences, University of Idaho, via phone), **David Hawk** (representing the Office of the Governor), **Scott Hughes** (Chair, Department of Geosciences, Idaho State University), **M. Jerome Mapp** (Western Planner Resources, Boise City and County Planning), **Paul Donaldson** representing C.J. Northrup (Chair, Department of Geosciences, Boise State University), **Stephen Weiser** (Assistant Deputy Director of Mitigation, Idaho Bureau of Disaster Services), and **Sharon Murray** representing Winston Wiggins (Director, Idaho Department of Lands).

Guests included: **John Carlson** (Idaho Department of Water Resources), **William Gale** (Idaho Division of Environmental Quality), **Charles Hatch** (Vice President of Research, University of Idaho), and **Steven Moore** (U.S. Bureau of Land Management).

The following staff were present: **Roy Breckenridge** (Director/State Geologist), **Charlotte Fullerton** (Management Assistant), **Virginia Gillerman** (Associate Research Geologist, Branch Office at Boise), **Reed Lewis** (Associate Research Geologist), **Kurt Othberg** (Director/Full Research Geologist), and **John Welhan** (Full Research Geologist, Branch Office at Pocatello).

## PROGRAM UPDATE

Kurt and Roy reviewed the meeting handouts and presented updates to the FY03 Annual Report. Items addressed included personnel issues, information regarding geologic mapping, new publications, geologic hazards, hydrogeology, and the Survey's continuing effort to provide education and outreach for the state of Idaho.

UI Vice President Charles Hatch explained the background of the Idaho Geological Survey's new enabling act (effective July 1, 2003) and its relationship to IGS's transition to the University of Idaho's Research Office under his oversight. He noted that this change has created new opportunities for the Survey to participate with other UI research entities and has opened new doors for research potential. Charles added that the Survey's interdisciplinary nature, focus on research, support of graduate and undergraduate education, and multiple locations in the state fits well with other institutes already a part of the Research Office. Institute directors meet about once a month so this framework provides Kurt and Roy a network and perspective to deal with similar issues and indicated he is pleased with the way it is working.

Charles summarized IGS's future role at the University of Idaho by stating that the IGS is very well positioned and any changes will probably not be apparent to this advisory group. He added, "It's the sort of program that we want all of our programs to be, as opposed to one we are trying to change. In that context, you will be seeing the University of Idaho changing and programs (at the UI) changing, but it will just provide a better foundation and better partner for IGS to work with and the changes we will see the Survey undertaking will be very transparent."

Roy expressed the Survey's appreciation for Charles Hatch's strong leadership and interest in the Survey and for his attendance and participation in this annual meeting. Roy noted one of the effects of the Enabling Act was to grant board-member parity among the state's three university

geoscience departments by adding the University of Idaho's Department of Geological Sciences to the Advisory Board.

Kurt announced that over the period, July 2003 through May 2004, the IGS has completed five digital Web maps (see <http://www.idahogeology.org>), four technical reports, sixteen STATEMAP deliverables, twenty-three staff reports, and Bulletin 30, "Tectonic and Magmatic Evolution of the Snake River Plain Volcanic Province."

## PERSONNEL NEWS

In December, the Survey was shocked by the sudden death of geological aide, Dan Weisz, who had been with IGS since 1996. Dean Garwood has been hired to fill that position temporarily.

This winter, the Survey conducted two personnel searches: a national search to replace Bill Bonnicksen (research faculty position), who retired at the end of last year, and a local search to fill the senior geologist position. After screening twenty candidates and interviewing four, the research faculty position was filled by William (Bill) Phillips, who will begin work August 16, 2004. Bill received his master's degree from Washington State University, worked for 10 years with the Washington Division of Geology and Earth Resources, received his Ph.D. from the University of Arizona at Tucson, and is currently completing a teaching contract at the University of Edinburgh, Scotland. Bill's expertise includes structural geology, cosmogenic dating, geochemistry, and mapping.

John Kauffman, with a master's degree in geology and many years of experience in basalts, was hired to fill our new senior geologist position in February. Previously, the College of Mines and IGS shared a laboratory director's position. With the establishment of the College of Science, the Survey recovered funding for a half-position, which allowed hard funding of approximately half of the senior geologist's position; the balance is funded by grants and contracts.

David Hawk expressed his concern about lack of continued mapping in southern Idaho as a result of Bill Bonnicksen's retirement. Kurt assured him that the Survey will continue to work in that region; currently, John Kauffman and Virginia Gillerman are working on the

Twin Falls quadrangle STATEMAP project.

## MINE SAFETY PROGRAM

Roy reported that the Survey acquired the Mine Safety program in FY03. Michael Weaver, principal investigator, is funded through the Mine Safety Health Administration (MSHA) grant.

Steve Moore commented that he recently took a class from Mike and found him to be a very knowledgeable presenter. Mike travels throughout the Pacific Northwest offering mine safety training. Kurt noted that Mike will also be presenting a session on mine safety at the Teachers' Workshop in Cascade in July. Roy urged people to call Mike if they require mine safety or first aid training.

## BUDGET ISSUES

Kurt and Roy reported that the FY05 budget allows a slight increase in salary enhancement, zero capital outlay, and a \$200 decrease in operating expenses.

David Hawk questioned whether the lack of CO was causing a safety problem with field vehicles. Kurt explained that the Survey has built a vehicle maintenance and replacement fund mostly provided by grant and contract funds. Consequently, with careful management, the agency has been able to properly maintain the vehicles and replace at least one vehicle with a newer used vehicle every two to three years.

David Hawk asked what the expected dollar value from Grants and Contracts for FY05 would be. Kurt indicated that it remains at a fairly steady \$400,000 from year-to-year, which is nearly half of the Survey's state-funded appropriation. Roy added that with the decreased number of staff this past year, careful planning was necessary to meet the required match on most of the federal funds. That situation will improve with the two new employees.

Charles Hatch explained that the UI develops a report of Grants and Contracts (fiscal year basis) showing expenditures and awards received. If partners subcontracted with UI, then figures will include the subcontracted portion. Several members, including Charles Hatch, David Hawk,

William Gale, and Paul Donaldson, suggested that the IGS consider developing a broader, easily read graphic report showing the current financial status and history (expenditures and revenue) of the Survey (publications, overhead earned, vehicle maintenance, etc.) and comparing it with previous years.

Charlotte Fullerton commented that the Survey's appropriated operating funds (\$25,900) were basically exhausted by the end of April this year. This situation requires the use of overhead earned funds to supplement operating funds through the rest of the fiscal year. Virginia Gillerman expressed her concern that this situation may hinder the Survey's ability to offer public service, which is one of the reasons IGS exists.

David Hawk asked what amount the Survey would need to fund required administrative OE/CO costs. Currently, the total administrative charges expended from overhead earned is \$24,800. Kurt and Roy indicated that they will be submitting the FY06 budget request within the next month according to the SBOE guidelines and will keep David apprised. Roy thanked the members for their suggestions on the budget.

Dennis Geist asked about Bill Phillips' startup funds. Roy stated that the Survey plans to absorb the cost of computer equipment for Bill's new office as well as some general operating expenses. Roy noted that this year's STATEMAP proposal commitment included time for Bill to visit each major field program not only to assist him in understanding the scope of the mapping project but also to offer him an opportunity to interact with his own expertise and interests. With Bill's background in cosmogenic dating, Roy expressed his concern that everyone wants to "get a piece of him" and noted that he is a well-established researcher who has his own priorities. It is Roy's understanding that Bill will be able to utilize laboratories at the UI and Washington State University for most of the sample preparations. However, he also has authorization to work on accelerator spectrometer equipment in California, Colorado, and Switzerland. Dennis stated that he would be available to assist Bill in any way he could, although he won't be available the first part of August.

Roy added that Bill also has expressed an interest in neotectonics (active faulting and earthquakes), which is a prime research need in Idaho. Currently, the Survey has funding from FEMA and Homeland Security for research related to such hazard issues.

Scott Hughes noted that ISU has an accelerator center and he has asked Frank Harmon, the Director, if he thought Idaho could develop this aspect of research. Harmon initially commented that it may not be financially feasible, but Scott thought that perhaps with Bill's expertise, this research area might be developed and "instead of charging out" we could be "charging in." Scott added that the state doesn't have any resource for gamma analyses that require an accelerator.

David Hawk will be attending a Governor's meeting June 14-15 to explore geoscience, material science, and biotech issues in the state. He indicated information shared in today's meeting has peaked his interest regarding this meeting.

## GEOLOGIC MAPPING AND RELATED ISSUES

Kurt reviewed the handout "Geologic Mapping Advisory Committee Long Range Planning Project Corridors and Geologic Mapping Areas for STATEMAP." This graphic illustrates not only the project corridors for long-range planning but geologic mapping completed between 1992 and 2003 as well as STATEMAP projects currently underway.

Kurt invited Stephen Weiser, chair of the Idaho Geologic Mapping Advisory Committee (IGMAC), to explain the history of the committee, priorities, and proposed plans. Kurt noted that IGMAC is a requirement of the National Cooperative Geologic Mapping Program. The need for such a committee was identified by the U.S. Geological Survey as a way to help them determine whether the proposals submitted by state surveys met the needs of a broader community rather than just pursuing "interesting geology." The initial task of the committee was to identify the urban and transportation corridors (marked in red) for the state. These are determined to be the areas of greatest need for geologic mapping. Stephen explained that the biggest problem in getting organized has been assembling a broad base of users of geologic information and admitted it has been difficult getting people together and urged more participation from board members and other state agencies.

David Hawk restated his interest for continued mapping in the approximately 10,000 square miles of southwest

Idaho for the potential discovery of minerals and oil and gas. He emphasized the dearth of scientific geologic information for that area and added that “no one in the oil and gas industry is doing research and development in Idaho anymore.” Stephen urged David to name someone who has those interests and would be willing to serve on the IGMAC committee. Kurt agreed with David that “looking towards the future” is an important goal for IGS and emphasized the Survey’s openness to more diverse mapping. Kurt noted that the agency would be interested in such projects if we can find funding to help support the research. Roy conceded the need to update oil and gas data.

Roy asked the Advisory Board members and guests for their ideas regarding priorities for future geologic research. During this discussion, he noted that in his role as the State Geologist, his membership in the Association of American State Geologists (AASG) provides a forum to facilitate priorities for national geology and earth resource issues.

William Gale asked about what percentage of the state’s area is mapped, and what percentage of the Survey’s maps and publications are available online. He suggested that his agency (IDEQ), as well as others, may be interested in an online subscriber service (for a yearly fee) that would allow full access to database and mapping information. Charles Hatch noted that such a subscription service would need to be addressed. Reed Lewis reported that only about 10% of the state is actually mapped, and a much smaller portion of the Survey’s maps are available digitally online. He recommended the National Geologic Database (NGDB) for searching for geologic information for any state and county in the United States. Maps are indexed by scale.

Kurt explained that currently there are two ways of putting maps online: The quick method is making a PDF file, which results in an electronic piece of paper, but the best way is producing a digital geologic map data model, which is a complete GIS format. The GIS format is quite time consuming and thus more costly to develop. Kurt supported the idea of obtaining funding by selling a subscription service, which could feasibly allow the Survey to produce the GIS format for additional maps.

Scott Hughes asked if there was a process for collective identification of who is mapping what and where? Roy indicated there is no formal way to do this, but he sees the AASG as a way to obtain and share this type of

information. He suggested passing on to the Survey information about such geological investigations in the state as they become known.

## PROFESSIONAL ACTIVITIES

IGS presented a special poster session in Boise at the joint meeting of the Rocky Mountain and Cordilleran sections of the Geological Society of America. Staff also presented posters at the Geological Society of America’s meeting in Seattle. Roy attended AASG meetings as well.

Kurt asked Scott Hughes to report on the Boise workshop for geologic mappers which Loudon Stanford helped to organize; attendees discussed problems and issues regarding digital geologic mapping. About twenty-four people attended, representing Idaho, Montana, Oregon, Washington, Utah and the U.S. Geological Survey. The workshop served as a successful medium to learn about mapping and how to get started. The Survey remains flexible (especially for EDMAP products and technical reports) in accepting various formats. Reed Lewis explained that acceptable formats are available on the IGS Web site.

Jerome Mapp noted that as a planner he represents a layperson using maps. He spoke of the importance of having a good foundation of geologic information in order to plan wisely. Scott Hughes assisted in teaching a geology workshop for realtors in Pocatello. Steve Moore was encouraged by efforts to bring geology to the layperson.

## SEISMIC ARRAY NETWORK

Stephen Weiser discussed the benefits of Earthscope and Earthworm and the seismic array network that will be moving through Idaho by 2005 and emphasized that a coordinating body will be needed to follow up on maintenance and data harvesting after NSF’s installation of seismic equipment. Stephen stated that he feels that should be the mission and role of IGS and suggested that the Survey’s Advisory Board should be a tool in making this happen. Charles Hatch asked what the source of support would be for the Survey to assume permanent ownership of the monitors. Several possible sources were discussed including the National Earthquake Hazards Reduction Program (NEHRP) as a leverage for state match funds.

## **ACTION ITEMS**

Roy summarized action items discussed: (1) Reformat the IGS contract and budget reports for the board meeting and annual report. (2) Distribute a survey assessing priorities of user need for Idaho. (3) Pursue the role of IGS as lead agency in coordinating an Idaho seismic array.

## **ANNOUNCEMENTS**

David Hawk stated that the annual meeting for the Rocky Mountain Section of the American Association of Petroleum Geologists will be in Denver, August 7, 2004.

The 2005 meeting will be held in conjunction with the Wyoming Natural Gas Fair in Jackson, Wyoming, at the end of September. He encouraged IGS representation, particularly regarding hazard issues and land use.

Jerome Mapp noted that a Western Planners' Convention will be held in Idaho Falls, September 22-24, 2004. He has invited John Welhan to speak to the group. William Gale indicated that his agency would also like to make a presentation at the meeting.

Roy and Kurt expressed their appreciation to all for attending the annual meeting. Following adjournment, lunch was served.









