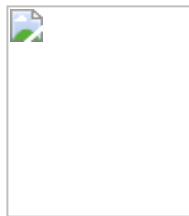


The Granite State Geologist



Newsletter of the New Hampshire Geological Society

Suite 133 * 26 South Main Street * Concord, NH 03301

Number 24 * October 1998

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Outgoing President's Message

Greg Kirby

Following three years as President on the NHGS Board of Directors, the time has arrived for me to step down and pass the baton to a new leader. This time has been a very fruitful sojourn for me, particularly for providing me the opportunity to establish several valued personal and professional relationships in the geologic community. I have also had the honor and privilege to work with several great people who have donated their precious time and energy to make the Society what it is today. Among those I have gotten to know, I wish to extend my sincere gratitude to Gretchen Rich, Dorothy Richter, Lee Wilder, Tim Allen, Gene Simmons, and all former board members for their help and loyalty to the Society. Special thanks goes to Tim, Gretchen, and Lee, who have served with me the longest, and to Julie Spencer for helping me out during the elections.

So, what has happened in the Society during my tenure as president? Thanks to the hard work of Tim Allen, and more recently Steve Shope, we have established a wide and varied membership that includes a listing of more than 180 people. Memberships reach out as far as Arizona. With the help of Nelson Eby, Lee Wilder and others of the Education Committee, we have donated approximately \$1200.00 to earth science teachers across the State. For the past four years we have had opportunities to learn of new happenings in both the glacial and bedrock geology of New Hampshire. Most notably, our biggest meetings were the talk on the Geology of the Presidential Range given by Dr. Dyk Eusden, and the field trip to the Isles of Shoals lead by Dr. John Brooks and Steven Richerich. Both events had over 80 in attendance. During my final year we have set up an [Ad Hoc committee](#) to lobby for a certification program for professional geologists. This, as we all know, is a necessary evil to ensure the security of our careers as the environmental industry progresses into the new millennium.

For the future I hope to see the Society to continue promoting geology to the community. I would like to see the [Lincoln Page Scholarship](#) and the Classroom Development Grant make even more funds accessible. I hope to see legislation pass allowing for P.G. certification. This will take a lot of hard work and money. I would also like to see the Society reach out to include more members in our programs. Although my term as President expires soon, I will not be out of the picture totally. I have the privilege to serve one more year on the Board, in the

position of Past President, so I look forward to a new year with you and a new set of guest lectures and summer outings.

In closing, thanks again for your support and for giving me the opportunity to work with all of you in further promoting the science and profession of geology.

New Bedrock Geologic Map Finally Here!

The new [Bedrock Geologic Map of New Hampshire](#) is finally available to the public. This long-awaited map has been 13 years in the making! Sheet No. 1 includes the complete bedrock geology of the state at a scale of 1:250,000, as well as cross-sections and a legend. Sheet No.2 includes three smaller-scale derivative maps showing (1) the distribution of major plutonic rocks along with fossil and isotopic age control data; (2) metamorphic facies; and (3) major structural features. Sheet No. 2 also provides a comprehensive list of data sources, and a lithotectonic map showing New Hampshire's relationship to the rest of the northern Appalachians. Each sheet is 54 inches tall by 42 inches wide. The publication of this map significantly adds to the information database of the state. The exceptional scientific substance of the map is the contribution of four outstanding authorities on New England geology directed by the [late Professor John B. Lyons](#) of [Dartmouth College](#).

The map is available from the [NH Department of Environmental Services](#), either folded or flat. The cost is \$10 (\$5 for schools); mailing costs are \$3 for the folded version or \$5 rolled. Send your order, with check payable to TREASURER STATE OF NH, to PIP Office-NH DES, PO Box 95, 6 Hazen Drive, Concord, NH 03302-0095. For more information, call (603) 271-2975.

Slate of Candidates for Officers of the Society

For President: Jack Jemsek. BS, Earth Sciences, 1981, University of Notre Dame. Ph.D., Geology and Geophysics, 1988, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution (WHOI) Joint Program in Oceanography. Jack has been employed with consulting firms in New England since 1988 and has been a Senior Environmental Professional with Jaworski Geotech, Inc. (JGI) in Manchester, NH since 1994. He is a Maine Certified Geologist, has been a member of AGU and NGWA for over 10 years, and participates in several geologic and environmental organizations based in New England. As a candidate for president, Jack hopes to increase participation and interaction among members, incorporate an annual review of the NHGS mission statement, address issues facing consulting professionals (i.e., state geologist certification and standards development organizations who are creating a plethora of "standard guides" for investigative work), and assist in sponsoring NHGS meetings, field trips and public outreach programs.

For Vice-President: Charles M Balyeat. BA Geology (plus one year of graduate studies), Miami University (Oxford, Ohio). M.Ed., The American University, Washington, DC. Retired to Sunapee in 1996 from the Central Intelligence Agency, where he was an Intelligence Analyst, Trainer/Instructor, or Administrator since 1963. Previously worked as a Photogrammetrist for the U.S. Geological Survey and Abrams Aerial Survey. Served in the US Air Force and the Air National Guard.

For Secretary: Leland (Lee) A. Wilder. BA, Geology, 1964, University of New Hampshire. MEd, 1993, Administration and Supervision, University of New Hampshire. Board of Directors, NH Science Teachers Association-one of his major functions here is to organize and lead field trips and workshops for NH Earth-Space Science teachers. State contact person for the National Earth Science Teachers Association. Member, Hopkinton Conservation Commission. NH native. Current Secretary of the NHGS. Teaches Earth-Space Science at Rundlett Junior High School, Concord. Adjunct college professor in Earth-Space Science courses. Married to Betsy (Osgood) and lives in Hopkinton, NH. They have a (married) daughter, Samantha, living and working in Boston, MA.

For Treasurer: Gretchen Rich. BS, Geology, 1979, University of New Hampshire. MS, Hydrogeology, 1986, Wright State University. Since 1980 working for consulting firms in the New York and New England area. She currently is office manager of the New Hampshire office of Coastal Environmental Corporation, a Bangor, Maine based company. Charter member of NHGS and current Treasurer. Member of AIPG since 1989, registered professional geologist in the state of Florida. Resident of Epping for seven years.

For Member-at-Large: Michael Robinette. BA Geology, University of NH 1974; MA Hydrogeology, University of Idaho 1977. Work experience in geophysics, geologic mapping, raindrop sizing for soil erosion / agricultural research, groundwater exploration and development, environmental investigations and remedial studies. Formerly a Superfund remedial project manager for the NHDES for 8 years. For the last 4 years has been a full time dad [no salary, long hours, great benefits, enormous personal satisfaction] and part time volunteer. Lives in Gilmanton NH with wife, Muriel, and 3 children.

Lincoln Page Scholarship Winner Announced

The Society wishes to congratulate Professor Mark Turski, Science Education Department, Plymouth State College, as the recipient of the Society's [Lincoln Page memorial Scholarship Award](#). Professor Turski teaches physics and physical science to education majors at Plymouth, and attended a workshop in Colorado to set up curricula for teaching earth science principles in physics. He used the scholarship to help defray transportation and workshop costs and will join us in October to summarize his experience.

The Society continues to advertise the Classroom Development Grant (up to \$300) and [Lincoln Page Scholarship](#) (3 at up to \$100) programs. To apply, interested teachers need only submit a letter with their school and home addresses and phone numbers explaining the applicant's experience to date with earth-space science teaching, and a narrative describing how they propose to use the funds and how this would benefit their teaching (not to exceed two pages), and a letter of support on school stationery from their principal. The deadline for consideration this year is December 1, 1998. Applications should be sent to the NHGS, Suite 133, 26 South Main St., Concord, NH 03301.

News from the Ad Hoc Committee on Professional Certification of Geologists in New Hampshire

Dorothy Richter

An [Ad Hoc Committee on Professional Certification of Geologists in New Hampshire](#) has met six times since January, 1998. Early meetings dealt with basic fact finding, and previous issues of the [Granite State Geologist](#) have [summarized some of the findings](#). At the April meeting of NHGS, Steve Shope made a brief statement about the certification issue that elicited supportive comments from the NHGS membership. Recent activities of the Ad Hoc Committee have centered on facing organizational and logistical issues. Discussions with geologists in NY, where a similar effort has been underway for a longer time, have helped. The current status of the Ad Hoc Committee is as follows:

Although many of the individuals participating in the Ad Hoc Committee are members of NHGS, the Ad Hoc Committee is not an official part of the NHGS. Ad Hoc Committee membership is open to all interested individuals. This is not an exclusive group. A current list of Ad Hoc Committee members is attached, and anyone interested in supporting and/or joining the Committee is urged to contact someone on the list. The Committee has been meeting once a month or so. The next meeting is to be at 5:30 pm on Wed., Sept. 30, at the office of Hager-Richter Geoscience, Inc. in Salem.

The current informal division of labor on the Committee is as follows:

- Chair (administer & coordinate meetings): Dorothy Richter

- Financial Chair (keep books & help w/ fund-raising): Gretchen Rich
- Legislative Liaison (obtain sponsors for legislation and to help with filing matters): Tim Stone
- NH-DES Liaison (keep NHDES and other state agencies informed of activities): Walter Carlson
- Corporate (work on incorporation issue): Gene Simmons

The Ad Hoc Committee has recognized that a formal organization must be established to provide a legal framework for raising funds to meet its objectives. The Committee expects that a not-for-profit not-tax-exempt corporation must be established, modeled after one established in New York (New York State Council of Professional Geologists). Tentatively named the New Hampshire Council of Professional Geologists, the new organization hopes to draw advice from a broad spectrum of individuals who would be willing to serve on its Advisory Board. Representation will be solicited from NHGS, AIPG, NGWA, AEG, other geologic professional societies, government agencies (state, federal, local), large and small corporations with geologic staff, universities, and related professionals. Membership in the new organization will be open to individuals and corporations. Membership fees will be modest for individuals, with graduated options to recognize increased support of the organization. Attracting a large membership will be critical to the success of this effort in order to demonstrate beyond question to the NH Legislature widespread support within the geologic community.

The objectives of the new organization will be: to strengthen and advance the geologic sciences as a profession; to promote the protection of public welfare and the environment through the professional practice of geologic sciences; to promote high standards of ethical conduct within the profession of geology; to promote the legal standing of geologists and their ability to practice geologic sciences in New Hampshire; and to promote the certification of geologists in New Hampshire through statutory regulation.

At this point, the Committee is focusing its efforts on "certification" rather than "licensing." There is a legal distinction. Both require education, experience, competence shown by passing an exam, and ethical conduct, but certification is a voluntary status (similar to an accountant vs. a CPA), whereas licensing makes it illegal to practice that profession without a license (e.g., a medical license is required for a physician to practice).

The Need

The certification of professional geologists practicing in New Hampshire would provide tangible benefits to the citizens of the State and to the governmental bodies and private organizations that rely on geological advice. It is the view of the Ad Hoc Committee on Professional Certification of Geologists in New Hampshire that:

- (a) In recent years, governmental bodies have increasingly come to rely upon advice from geologists when formulating laws and policies to protect the environment and the safety, property, and well-being of the citizens of New Hampshire.
- (b) Some Federal and State regulations require that geological investigations be performed and the geological conditions be interpreted.
- (c) Expert opinions regarding the geological conditions of an area provided to regulatory bodies, State or local governmental agencies, and the public can have significant impacts on the environmental quality of New Hampshire and on the safety, property, and well-being of its citizens.
- (d) On a worldwide basis, natural geological events such as earthquakes, floods, and landslides annually cause billions of dollars in property losses and the deaths of thousands of persons. This loss of life and property, in many instances, has been reduced when advice provided by geologists has been accepted and appropriately acted upon in time by governmental bodies and citizens.
- (e) The environment and the safety, property, and well-being of the many citizens of New Hampshire are significantly threatened by natural geological hazards such as radon, flooding, landslides, coastal erosion, and earthquakes.

(f)The environment and the safety, property, and well-being of the citizens of New Hampshire also are significantly threatened by geological and hydrogeological hazards related to the acts of humans such as contamination of groundwater resources.

(g)The advice of geologists is needed to assist the citizens and governmental bodies of New Hampshire in reducing their exposure to risks due to the environment and to their safety, property, and well-being from other geological hazards, both natural and human-caused.

(h)As in the case with other professions that directly affect their safety, property, and well-being, the citizens of New Hampshire need assurance that persons offering services as professional geologists are adequately trained and experienced and are practicing their profession in an ethical manner.

The Benefits

The benefits to society in general and to the citizens of New Hampshire in particular would arise from the assurance that geological advice that affects their safety, property, and well being is being provided by professional geologists that have satisfied established standards for education, experience, competence, and ethical conduct.

The Costs

This is not a request for funds. However, during its fact finding stage, the Committee learned that significant financial costs (\$15K to \$20K) may be incurred to establish legislation for certification of geologists. Membership fees for the new organization, will be used to pay for such costs. Seed money, to be offset against future membership fees and to be acknowledged in future newsletters of the NHCPG, may be sent to:

NH Council of Professional Geologists
c/o Gretchen Rich
Coastal Environmental
P.O. Box 10
Epping, NH 03042

For more information, contact Dorothy Richter at (603) 893-9944.

Upcoming Events

The [New England Intercollegiate Geological Conference \(NEIGC\)](http://neigc.org/NEIGC/) will be held October 9-11, 1998, hosted by the University of Rhode Island. Field trips will encompass glacial, structural and metamorphic geology of Rhode Island, eastern Connecticut, and southeastern/southcentral Massachusetts. For more information, contact Professor Daniel P. Murray, Department of Geology; University of Rhode Island, Kingston, RI 02881 E-mail: dpmurray@uriacc.uri.edu, or check the NEIGC Website at: <http://neigc.org/NEIGC/>

In support of the effort to license geologists in New Hampshire, the [Ad Hoc Committee](#) is scheduling a meeting at which Bill Knight, Executive Director of the [American Institute of Professional Geologists \(AIPG\)](#), will present a short seminar on pursuing geologist licensing legislation. The meeting is tentatively scheduled for October 22, 1998 in the afternoon or evening. If you are interested in attending, please contact Tim Stone at 603-433-1935 and mark this date on your calendar. More information will be available at the October NHGS meeting.

Geophysics Explained: Magnetic & Seismic Methods

Paul Hague

Editors Note: This is the third and final article in a series. The first two articles discussed [Ground Penetrating Radar](#) and [Electromagnetic techniques](#).

Magnetics

Magnetometers measure perturbations of the earth's magnetic field very accurately. Typical sensitivity of these instruments is 0.1 nanotesla or gamma, and the total intensity of the earth's magnetic field varies between 25,000 (near the equator) and 65,000 (near the poles) gammas. By recording minute variations in the earth's magnetic field over an area of interest, and making a contour map of the data, one can quickly locate buried objects having magnetic susceptibility (those containing iron). Some examples of these instruments' sensitivity are: it is possible to detect a 10-inch cast iron file at a depth of ten feet, or an object the size of a car at 100 feet. Magnetometers can be used to detect old landfills or caches of buried drums, or to map some geologic features such as basalt dikes, and to locate archaeological features such as buried foundation walls or old campfire sites. Any objects that produce a magnetic anomaly will be detected by a magnetometer, so this method can also be affected by such things as overhead power lines or chain-link fences near the site of investigation.

Seismic

Seismic instruments work by recording reflected (or refracted) acoustic energy detected by transducers called geophones, which are spread out in lines across the surface of an area being investigated. The geophones are very sensitive receivers, which convert acoustic vibrations in the ground to electrical signals. The geophones are all connected to an instrument called a seismograph, which records the electrical signals from each geophone individually and allows for processing. A source of acoustic energy is used to send sound waves into the ground. Depending on the depth of information required, the source may be explosives, vibrations produced by special "shaker" trucks, a falling weight, or simply blows of a sledgehammer on a steel plate. As the acoustic energy travels through the ground, some energy is reflected or refracted at interfaces in the subsurface which have different densities and elastic properties. The reflected or refracted energy is then picked up by the geophones and recorded for processing by the seismograph. By doing multiple source-multiple receiver seismic surveys, one can get a very good idea of what subsurface conditions are like. Seismic surveys are generally classified into two types: "shallow" and "deep". Shallow surveys are performed for engineering, geotechnical and environmental purposes such as locating the depth to bedrock, or mapping a gravel deposit or an aquifer. These surveys generally compile a seismic profile or 3D image only a few hundred feet below the surface or less. Deep surveys are either done for research purposes or to locate potential oil and gas deposits, and will provide profiles many thousands of feet deep.

All of the geophysical methods described in this series are generally called "remote sensing", and all will benefit from the "ground truth" that is provided by borehole logging or coring. However, remote sensing methods allow for intelligent placement of drillholes, thereby minimizing cost.

Found on the Internet, strictly for your amusement

DEAR ANN LANDERS:

This letter, my first ever to an advice columnist, was sparked by your column about the geologist's wife who asked, "Are all geologists the very embodiment of all the virtues and qualities that are universally admired in humankind? Have they alone, of all the professions, achieved a state of grace far beyond that ever speculated by history's most hopeful philosophers and theologians?"

The answer is: ABSOLUTELY!

My father was a geologist. My three brothers and four uncles are geologists. Geologists ARE a different breed. They are wise, often strikingly handsome, kind to small children and animals, sensitive to the subtleties of everything around them, and when it comes to relationships, well, Mom, my three sisters-in-law, and my four aunts seemed always to have a serene, deeply satisfied look of complete contentment. If only I could have hitched up with one too.

signed, A Jealous and Bitterly Resentful Wife of an Engineer

NHGS News and Events

The **1998 Annual Meeting of the NHGS** will be held Thursday, October 8, 1998 at the Wayfarer Inn in Bedford, and features the election of a new Board of Directors. The guest speaker will be Professor Franz Anderson of the University of New Hampshire, who will offer his current thoughts on the effects of ocean currents in the Great Bay Estuary. The meeting will begin at 6:00 p.m. with a cash bar, followed by dinner at 7:00 p.m. Costs will be \$17.00 for members, \$18.00 for non-members, paid in advance. An additional \$2.00 surcharge will be collected from those paying at the door. Reservations are necessary, and will be accepted until Wednesday afternoon, October 7, 1998. For more information, contact: Gretchen Rich at (603) 679-6775, or Greg Kirby at (603) 271-3624.

The week of October 11-17, 1998 has been proclaimed by Governor Jeanne Shaheen as **New Hampshire Earth Science Week**. The proclamation states that "geology and the other earth sciences are fundamental to the safety, health, and welfare of New Hampshire's citizens and to the economy of the state." With this proclamation, New Hampshire joins a long list of other states, and the nation, in observing Earth Science Week.

The next meeting of the NHGS Board of Directors is scheduled for 6:00 pm, Monday, November 30, at the Merrimack Town Hall.

Meetings of the Society in 1999 are set for January 14, April 8, and October 7, with the annual field trip and family outing on August 14. Mark these dates on your 1999 calendar now!

Please, send stuff for the newsletter to: Tim Allen, MS 2001, Keene State College, Keene, NH 03435-2001, telephone: 603-358-2571, fax: 603-358-2897, or preferably by e-mail: tallen@keene.edu Electronic submissions in the form of plain ASCII text are preferred. To make the January 1999 newsletter, submissions must be received before December 15, 1998!

Visit the New Hampshire Geological Society's web-site, at URL: <http://nhgs.org/NHGS/>

Last Modified September 28, 1998

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