The Granite State Geologist

Newsletter of the New Hampshire Geological Society
PMB 133 • 26 South Main Street • Concord, NH 03301

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President's Message

Jack Jemsek

In the last newsletter, I tried to explain why we should all be getting more involved in promoting geology in the state and making NHGS a better organization to be a part of. However, a lesson has been learned since then. Only a handful of people attended the July field trip and the August family outing. We also received few nominations for new board members to be elected at the October meeting. Given the geologic-related issues and events which are going on in 1999, this is surprising. How can any red-blooded geologist be insulated from newsworthy issues such as the licensure of professional geologists in NH, debate on MTBE standards, Year 2 of Earth Science week, consulting work throttled by the mini-boom in land development/transfer, as well as hurricanes, floods, droughts, and earthquakes.

What I have found is that it takes more than a few written words in this newsletter to motivate people to be active in a technically-oriented special interest organization. It takes a little bit of phone-calling, cajolery, and even admonishment. So I learned my lesson.

Here is a revised message to NHGS members—*there is more work to do than can be done by the NHGS board members alone!* There is much that the NHGS could be doing or doing better, but it will take more than just the six or seven board members. We need to revitalize the membership so that there is participation on some level by each and every member. Attendance at the upcoming October 7 Annual Meeting would be a good start, but attending and enjoying the NHGS dinner meetings is easy. While you are there, speak with one of the board members about volunteering for one of the NHGS committees such as finance, membership, education, program, legislative watch, nomination, or publications. E-mail me at jemsek@tiac.net if you have some thoughts on getting involved, or you risk the threat of me wheedling you in a public place!

To keep the NHGS invigorated, the board members have been kicking around ideas on changing the by-laws so that perhaps there is a rotation scheme or a president-elect position established on the board. There are pros and cons to this and it must be researched. But it seems that revision of the by-laws may be in order to allow functions of the board to proceed in a more productive fashion. We plan to look in to restructuring our board after the elections.

I was pleased to find Wally Bothner at UNH, Dick Birnie at Dartmouth College and Tim Allen at Keene State College receptive regarding forming some liaison with their respective student geology clubs. It was a shock to see that among our 150+ members, there are very few students. I think it is the involvement of youth in the NHGS that will make the difference in the long run. Lets face it—they need us and we need them.

Congratulations to the New Hampshire Council of Professional Geologists (NHCPG) for succeeding in gaining a Memorandum of Understanding from a coalition of geologists and engineers promoting the proposed bill for licensure of professional geologists. The Senate committee has a hearing on the bill in October (see below).

See you all at the October 7 dinner meeting featuring Dr. Guswa's talk on contaminant hydrogeology, remediation and the Woburn Toxic Trial.

Change of Address!

The NHGS's mailing address has changed! The new address is:

New Hampshire Geological Society
PMB 133
26 South Main St.
Concord, NH 03301

After October 26, the Post Office will return to sender any mail sent to NHGS that does not follow the above address format.

The world-wide-web address remains unchanged:
http://nhgs.org/NHGS/ or simply www.nhgs.org
Be sure to stop by and see our colorful new banner!

Slate of Candidates for the Y2K Board

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 Joint Program in Oceanography. Jack has over 10 years experience in environmental consulting and has been a Senior Environmental Professional with Jaworski Geotech, Inc. in Manchester, NH since 1994. He is a Maine Certified Geologist and a Massachusetts Licensed Site Professional. He hopes to more actively recruit new members, especially among the educational sector of the geologic community; encourage members to participate in committees; work with the NHCPG to enable passage of the licensed professional geologist act; help guide the NHGS in having great meetings, field trips, and newsletters; and increase public awareness of geology in New Hampshire through the NHGS-sponsored public outreach programs and participation in Earth Science Week. NHGS president since 1999.

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 from the Central Intelligence Agency, where he was an Intelligence Analyst, Trainer/Instructor, or Administrator since 1963. NHGS Vice-President since 1999.

Anthony P. Giunta. BS in Physics, 1982, and an MS in Geophysics, 1985, both from Boston College. Currently a Hydrogeologist with the NH-DES Groundwater Protection Bureau.

For Secretary:

Richard B. Moore. Bachelors degree in Hydrology from the University of New Hampshire, and a Masters degree in Geology, also from the University of New Hampshire. He has served as public servant with the U.S. Geological Survey for 19 years. He is presently the project chief of the New Hampshire Bedrock Aquifer Assessment.

Leland (Lee) A. Wilder. BA Geology, 1964, University of New Hampshire. MEd, 1993, Administration and supervision, University of New Hampshire. Past President, Board of Directors, NH Science Teachers Association. Past state contact person for the National Earth Science Teachers Association. Member, Hopkinton Conservation Commission. NH native. Retired from teaching Earth-Space Science after 35 years in NH public schools. Adjunct professor in Earth-Space Science - currently at Colby-Sawyer College. NHGS Secretary since 1995.

For Treasurer:

Gretchen Rich. BS, Geology, 1979, University of New Hampshire. MS, Hydrogeology, 1986, Wright State University. Currently office manager of the New Hampshire office of Coastal Environmental Corporation. Treasurer of NHCPG. Member of AIPG since 1989, registered professional geologist in the state of Florida. NHGS Treasurer since 1996.

Steven W. Youngs. BS, Geology, 1978, William & Mary College; MS, Structural Geology, 1981, Washington State University; MS, Water Resources Management, 1988, University of Wisconsin. Currently Environmental Projects Manager with Provan & Lorber, Inc. in Contoocook.

For Member-at-Large (two-year term):

Timothy T. Allen. BA, Geological Sciences, 1984, Harvard University. MS, Geology, 1990, and PhD, Geology, 1992, both from Dartmouth College. Currently Associate Professor of Geology and Environmental Studies at Keene State College, where he has been on the faculty since 1992. NHGS Member-at-Large since 1993.

The continuing Member-at-Large is Michael Robinette, whose term expires at the end of 2000.

Nominating Committee: Greg Kirby

Membership Renewals Due

By now, you should have received your membership renewal invoice. Hopefully you have already sent in your renewal. Check the mailing label on this newsletter to confirm your status. If you are not up-to-date, you need to get your renewal in before Thanksgiving to ensure your inclusion in the NHGS Millennial Membership Directory! Questions about membership status should be directed to Steve Shope, 603–778–3988, e-mail: sshope@nh.ultranet.com.

Upcoming Events—mark your calender!

New England Intercollegiate Geologic Conference

The New England Intercollegiate Geologic Conference (NEIGC) will take place October 1-3, 1999, based at the University of Vermont in Burlington. There will be an all-day special Symposium on Surficial Geologic Mapping in New England preceding the NEIGC, on Thursday, September 30, at the Ramada Inn off I-89 in South Burlington (which is also the site of the NEIGC welcome party on Friday night and the banquet Saturday night). For more information, visit the NEIGC web-site at http://neigc.org/NEIGC/ or call Barry Doolan at 802-656-0248, e-mail: bdoolan@zoo.uvm.edu

Capital Mineral Club Gem and Mineral Show

The 36th Annual Gem and Mineral Show, sponsored by the Capital Mineral Club, will be held Oct. 2-3, 1999 at Sunapee State Park on NH Rte 103 in Newbury, NH.

White Mountains Geology Workshop

Wood Thompson of the Maine Geological Survey will lead a workshop on the glacial geology of northern New England on the weekend of October 16 & 17, sponsored by the Mount Washington Observatory. For more information, or to register, contact the Observatory at PO Box 2310, North Conway, NH 03860, call 800-706-0432, or check the Observatory's web site at http://www.mountwashington.org/

Vermont Geological Society Meeting

The Vermont Geological Society's Annual Meeting and Election of New Officers will be October 19, 1999, 6 pm at Arvads in Waterbury. For more information, contact Marjorie Gale, 802-241-3608 or e-mail: marjieg@dec.anr.state.vt.us

Mount Washington Observatory EduTrips

Experience the summit of Mount Washington in the winter—ride up on the snowcat and spend the night! NHGS member Lee Wilder will be leading "A Special Mount Washington Trip for New Hampshire Science Teachers" on February 17 & 18, 2000; and NHGS members Mark Van Baalen and Tim Allen will lead an EduTrip about "Geology and Global Climate Change: A Mount Washington Perspective" on March 18 & 19, 2000. For more information, or to register, contact the Observatory at PO Box 2310, North Conway, NH 03860, call 800-706-0432, or check the Observatory's web site at http://www.mountwashington.org/

Earth Science Week

Lee Wilder

The second annual National Earth Science Week will be October 10-16, 1999. On Wednesday, September 22, Governor Shaheen signed a document proclaiming the week of October 10-16 as New Hampshire Earth Science Week, joining many other states in this event. Several middle school and college students, with help from NHGS members Lee Wilder and Bob Whitmore, have been developing a display about New Hampshire's geology for the State House Visitor Center in Concord. In addition, some members of the NHGS have volunteered to help NH Science Teachers with Earth Science Week '99, serving as contacts for questions, ideas or as guest speakers to visit class rooms:

Lee Wilder, Mid-Central NH
746-3205 lwilder@bigfoot.com

Tim Allen, Monadnock Region
355-3280 tallen@keene.edu

Gretchen Rich, Seacoast Region
679-1252 dfgr1269@aol.com

Charlie Balyeat, Dartmouth-Lake Sunapee Region
763-7402 idena@cyberportal.net

Bob Whitmore, Mid-Central NH
529-2621

Greg Kirby, South-Central NH
429-8407 g_kirby@des.state.nh.us

As active members of the geologic profession, all NHGS members should help spread the word about our field during this "teachable moment." Let the teachers in your local schools know that a wonderful FREE packet of classroom information, posters, and activities is available from the American Geological Institute (AGI) at http://www.earthsciweek.org or call 703-379-2480. In addition, teachers can obtain a full sized (42 x 54 inch) copy of the new Bedrock Geology Map of New Hampshire from the PIP Office, NH Dept. of Environmental Services, P.O. Box 95, 6 Hazen Drive, Concord, NH 03302-0095 for only $5 ($10 for others). Smaller 8 1/2 x 11 Simplified and Generalized versions of the map can be downloaded from the web for free; see http://nhgs.org/NHGS/NHGeol.html Get ahold of these items yourself and donate them to your local school, or hang the Earth Science Week poster in your office reception area. Support Earth Science Week!

An Update on NHCPG Activities

Jack Jemsek

After a year of hard work by the New Hampshire Council of Professional Geologists (NHCPG), Senate Bill 181-FN to establish licensure for professional geologists will be heard by the Senate committee on October 5, 1999. Congratulations to Dorothy Richter, president of the NHCPG, members of the NHCPG executive committee, board of directors and board of advisors, and to NHCPG's many corporate and individual sponsors. The breadth of support for the bill has been tremendous for many reasons. The bill has encompassed the interests of the New Hampshire geologic community and its parts, with nary a geologist who opposes the bill. Much research was involved in writing the bill which is modeled after similar bills signed into law in other states.

The bill will also include important viewpoints and contributions from the engineering community via the participants of the Joint Working Group on Proposed Licensing of Professional Geologists (JWG). The JWG includes representatives from the NHCPG, the NHGS, the Consulting Engineers of NH, the NH Society of Professional Engineers, and the American Society of Civil Engineers. Representatives of the Department of Environmental Services have also participated in the JWG.

The JWG has just completed a Memorandum of Understanding which has been signed by the representatives of the participant organizations. This memorandum will be included in an information packet being prepared by the NHCPG explaining the need for licensure and why passage of the bill is a good thing for New Hampshire. A copy of the original draft Senate Bill 181-FN may be reviewed on the web at www.state.nh.us/gencourt/bills/99bills/sb0181.html Bear in mind that this draft does not include changes which have been incorporated as a result of the JWG.

NHGS is providing financial support to the NHCPG mission by advertising on their web page at http://www.nhcpg.org/. Tim Allen has created a colorful NHGS banner made of geologic map patterns inset in the NHGS logo. While you are on the web, don't forget to visit New Hampshire's number one source for geologic information at http://nhgs.org/ Kudos to Dr. Allen, editor of *The Granite State Geologist* and webmaster, for getting NHGS material published and looking good in so many formats.

News from the U.S. Geological Survey

Richard Moore

The New Hampshire Bedrock Aquifer Assessment, sometimes referred to as part of the BRASS program, is a 7-year project which was initiated in 1994 by the US Geological Survey (USGS) in cooperation with the New Hampshire Department of Environmental Services (NHDES). The objectives of the project are to conduct detailed geologic mapping, identify potential high-yielding sources of groundwater, analyze the quality of water from this source, and evaluate geophysical tools for locating potential groundwater sources.

The detailed mapping effort is somewhat unique in that it is being conducted jointly by an integrated team of USGS hydrogeologists and geologists. In the past, water resources and geologic mapping programs have generally been separated. Moreover, if significant improvements are made using this mapping effort, it would be good news for those of us who would like to see more geologic mapping in the State of New Hampshire.

Bedrock lithology of the two areas in the State with the greatest number of bedrock wells, the Pinardville and Windham quadrangles, were mapped. Additionally, the orientations of fractures and other structural features were measured at numerous bedrock outcrops. The purpose of structural information is to potentially improve the statistical relations between mapped-bedrock features and well yields. The statistical evaluation of the geologic mapped data relative to well yields reported by the NHDES well data base/maps is scheduled to be concluded this winter.

Data from more than 21,000 bedrock wells in the NHDES well data base allow statistical relations to be developed between yields of the bedrock wells and factors such as the mapped bedrock units, the type of sediment overburden, the topographic setting, and the proximity of lineaments to the wells. As part of this effort, lineament maps were produced for the entire State, and are available as printed maps or digital Arc-Info coverages. Results of the statistical analyses should aid towns and their consultants to locate potential sources of groundwater.

The quality of well water and the type of rock in which the wells were drilled will also be analyzed. Of the more than 21,000 bedrock wells that were geographically located by NHDES, 1,353 have been matched with

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news from USGS, continued

1,818 water-quality samples analyzed at the NHDES lab. These correlations are being used to assess the probable chemical character of water withdrawn from various rock types throughout the State. Chemical constituents of the bedrock aquifers are being mapped and analyzed in collaboration with the USGS New England Coastal Basins National Water-Quality Assessment (NAWQA) Program.

The effectiveness of geophysical tools and procedures, used in locating potential high-yield zones for specific bedrock well sites, are also being evaluated. The USGS is examining EM-34 (inductive terrain conductivity), ground-penetrating radar, 2-dimensional electrical-resistivity profiling, VLF (very low frequency electromagnetics), azimuthal or square array resistivity, seismic refraction, and borehole techniques.

All USGS map products from this project are made available in Arc-Info format through the New Hampshire -Vermont District office in Pembroke, N.H. and are provided to the New Hampshire State "GRANIT" Geographic Information System. For additional information about geologic mapping visit the web site http://geology.er.usgs.gov/gmapeast/brass/brass.html. The geologic map for the Windham quadrangle can be downloaded from the web site http://pubs.usgs.gov/openfile/of99-8/. For printed copies of the bedrock lineament maps contact Debra Foster at (603) 226-7837.

For further information, contact Richard Moore at the USGS, telephone (603) 226-7825, or visit the web site http://nh.water.usgs.gov/CurrentProjects/bedrock.htm.

News from the NH Department of Environmental Services (DES)

Jack Jemsek

We are following-up issues regarding MTBE, the infamous gasoline oxygenate, which were discussed in the last newsletter: Senate Bill 70 became law in July 16, 1999. The law authorized DES to do the following: 1) to continue study of MTBE alternatives in gasoline which will protect air quality, 2) to request the U.S. Environmental Protection Agency (EPA) to immediately approve a gasoline alternative in New Hampshire, and 3) to adopt primary and secondary standards for MTBE based on a review which must be completed by January 1, 2000. The review was to include the basis for California's health standard of 13 parts per billion (ppb) and aesthetic standard of 5 ppb, and Maine's 35 ppb MTBE health standard. DES subsequently sent request for a temporary waiver from the reformulated gasoline program requirements in four counties to the EPA on July 21. DES also created a task force to develop new MTBE standards.

On July 27, the EPA's Blue Ribbon Panel on Oxygenates and Gasoline reviewed MTBE's risks and benefits and concluded that a rapid reduction of MTBE use in gasoline was necessary due to water pollution issues. It appears that the EPA will work with Congress to revise the reformulated gasoline program, which has been credited with limiting air pollution from vehicle exhaust, to include phasing-out MTBE. Word has it that without federal action, it is possible that the New England states may seek a regional solution to an alternative fuel. By the way, we are still looking for a DES candidate to write this column on a regular basis in the future!

Field Trip Report—Bedrock Geology of the Nashua Trough

Dr. Patrick Barosh led a band of eight curious geologists out on a hot Saturday July 17 to peruse stratigraphic relationships in the area referred to as the Nashua Trough. A total of seven stops were made to observe the Late Proterozoic rock bounding the trough (Paxton Group and Oakdale Formation, a.k.a., Berwick Formation), as well as the Ordovician turbidite section (Nashua Group) preserved within the fault trough itself. The Ordovician rock, best illustrated in outcrops located just north of Route 101A near the Nashua/Merrimack line, was comprised of metasiltstones, phyllite and quartzites. The turbidites displayed relict sedimentary features such as fining upward sequences, laminations and load casts.

The last scheduled stop were sublime outcrops of the Berwick Formation bounding the north side of the Nashua Trough. Greg Kirby then treated the group to a significantly improved exposure of the same formation—a relatively new road cut exposing an intensely-folded and faulted Berwick Formation along Industrial Drive off the Everett Turnpike. The enormous exposure was certainly the most impressive rock section observed from a structural standpoint, and also happened to be Greg's thesis study area. Thank you Pat for a great tour and good luck with that thesis Greg!

We'll report on the Ossipee Ring Dike trip next issue!

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The broad purpose of the New Hampshire Geological Society is to advance the science of geology in New Hampshire. We hope to pursue this goal by contributing to public education, strengthening the role of geology in environmental concerns, and disseminating knowledge about the geology of the Granite State. Membership in the society is open to all, including professional geologists in all areas and interested lay people.

NHGS News and Events

The **1999 Annual Meeting** of the NHGS will be held Thursday, October 7, 1999 at the Wayfarer Inn in Bedford, New Hampshire. In addition to the election of officers and other society business, NHGS is honored to host guest speaker Dr. Jack Guswa of HSI GeoTrans, Inc., who will give a presentation entitled "Hydrogeologic Issues of the Woburn Toxic Trial". The talk follows the recent book and movie *A Civil Action* by Jonathan Harr which involved the interpretation of hydrologic, geologic and chemical data from the infamous Woburn, Massachusetts trial of *Ann Anderson, et al. vs. W.R. Grace & Co. et al.* Dr. Guswa was an expert witness for the for the co-defendant W.R. Grace. He continues to be a principal consulting hydrogeologist for remedial action taking place at the Wells G & H Superfund site. In his talk, he will touch upon the fundamental components of the 1986 hydrogeologic conceptual model, aspects of the historic trial, how the jury evaluated the technical data, and the current conceptual model and remedial status of the site. To "read up" on the issues, *read the book* or visit the following web sites:

http://www.geology.ohio-state.edu/courtroom/
http://www.epa.gov/region01/remed/sfsites/wellsgh.html
http://www.wrgrace.com/html/woburn.html

The festivities will be begin at 6:00 PM with a social hour and cash bar, followed by dinner at 7:00 PM. **Reservations are necessary** and will be accepted until Wednesday afternoon, October 6, 1999. Please use the enclosed form to pre-pay and make your dinner selection. The cost is $17 for NHGS Members and $19 for non-members paid in advance. An additional $2 surcharge will be collected from those paying at the door. For more information, contact Charlie Balyeat at (603) 763-7402 or Gretchen Rich at (603) 679-6775.

Meetings of the Society for the Year 2000 have been set for Thursday, January 13; Thursday, April 13, and Thursday, October 12. The Board of Directors is scheduled to meet next on Thursday, November 4, 1999. The submission deadline for the next issue of the newsletter is Wednesday, November 24, 1999.