Granite State Geologist

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WELCOME WINTER! HAPPY HOLIDAYS! HAPPY NEW YEAR!

2009 GSNH BOARD OF DIRECTORS ELECTION RESULTS

Submitted by Paul Rydell, GSNH Member-At-Large

The election of the 2009 GSNH Board of Directors (BOD) was recently held at the Annual Dinner Meeting on October 16, 2008, at the Cat 'n Fiddle Restaurant in Concord. Forty-two GSNH members voted. The winners are indicated below, with the term they will be entering noted:

President Jutta Hager (2nd term)	**Society Vice-President** Lee Wilder (3rd term)
Council Vice- President Mike Burke (2nd term)	**Secretary** Doug Allen (3rd term)
Treasurer Rich Moore (3rd term)	**Member-at-Large** Paul Rydel (2nd term)

The second Member-at-Large is Ralph Wickson, who will be serving the second year of his current two-year term in 2009. Congratulations to the 2009 Board of Directors! Contact information for each of the BOD members is shown to the left and is also posted on the GSNH website.

MESSAGE FROM THE PRESIDENT

Submitted by Jutta Hager, Hager GeoScience, GSNH 2008-2009 President

After a quiet summer, we had an eventful October that included both the Annual Dinner/Election Meeting and a field trip to the Palermo Mine. Fifty-eight people, including 42 voting members, attended the fall meeting. In keeping with the Earth Science Week theme of "No Child Left Inside," our featured speakers were Perrin Cothran Chick, Education Director of the Seacoast Science Center, and Iain MacLeod, Executive Director of the Squam Lakes Natural Science Center. Each spoke about their center's programs

emphasizing hands-on experience in exploring the natural world, with emphasis on both fresh and salt water activities. A special treat was the speaker introduction by Allison Eames, who has been studying rocks and minerals in her 4th-grade class. Allison is the daughter of the GSNH Newsletter editor Bettina Eames. Bob Whitmore also made the Palermo Mine field trip a success. An article about the trip by Julie Spencer appears elsewhere in this newsletter. Our additional thanks go to Bob for his donation of 13 trays of minerals to the GSNH. As always we had our traditional raffles. Julie Spencer won the book "Well..What's All that Drilling about?" and Vinnie DellaRusso won the book "Under New England". The 2009 meetings should again be both interesting and educational, with speakers addressing the topics of climate change (upcoming January meeting), Marcellus Shale overview (April), and research in Antarctica (penciled in for next October). I wish you all happy holidays and enjoyable times with friends and family. I look forward to seeing you at the January 8th, 2009 meeting!

GSNH FALL FIELD TRIP Submitted by Julie Spencer, GSNH Past-President

Approximately 22 geologists and geology enthusiasts gathered on October 26, 2008 for a tour of the Palermo Mine in Groton, New Hampshire. We were hosted by member and mine-owner, Bob Whitmore, who graciously offered his mine for a fall field trip after the cancellation of our summer trip. Bob was assisted by Jim M. of the University of New Orleans, who is currently doing research on pegmatites at the mine.

It was a beautiful, sunny fall day, perfect for wandering around the mine, collecting minerals. Historically, muscovite mica was mined at Palermo, but over 150 other mineral species have been found there, including quartz, beryl and triphylite. (See Bob's article on the history of Palermo in this newsletter). If you have not been to Palermo before, it is a real treat on a sunny day as the ground just sparkles with the mica. There are 16 pegmatites on the 100-acre property. We toured Palermo Numbers 1 and 3, collecting books of mica and pieces of beryl along the way. We were able to walk into Palermo No. 1 a good distance, and then we turned off our flashlights to experience what "dark" really is. You don't know dark until you're inside a mine! It was easy to see why they carry back-up lights when they work in the mines. Bob's sense of humor is evident when you need to sit on the "throne" for a nature break. He has built a small castle to house the facilities! Thank you to Bob for hosting a very enjoyable day. *Photo: Courtesy of Julie Spencer*

GEOLOGY OF THE PALERMO MINE Submitted By Robert Whitmore

The Palermo No.1 mine is a granitic pegmatite located in the village of North Groton and lies within the Grafton pegmatite field of west-central New Hampshire. The Grafton field is known for pegmatites that are generally considered to display low to medium degrees of geochemical and mineralogical evolution (barren; beryl; beryl-phosphate and beryl-columbite-phosphate subtypes). The Palermo No.1 pegmatite is world renowned for producing a wide variety of primary and secondary phosphate minerals. Ten mineral species new to science have been described from Palermo No.1 including: wolfeite, bjarebyite, palermoite, whitmoreite, goedkenite, schoonerite, samuelsonite, foggite, whitlockite and xanthoxenite. The Palermo No.1 and a number of other nearby pegmatites are hosted by the sillimanite-muscovite grade

metamorphic rocks of the upper unit (Kearsarge) of the Devonian Littleton formation. The Kearsarge member of the Littleton is composed of alternating beds of mica quartzite and mica quartz sillimanite schist that typically display graded bedding features (Malinconico 1982). These units were deposited as flysch during the later stages of the closing of Iapetus ocean during the early Paleozoic (Malinconico 1982). Field relationships suggest that the emplacement of the Palermo No.1 pegmatite most likely occurred subsequent to or during the later stages of the Acadian orogeny (~380 to 360 Ma) (Nizamoff, 2006).

For more information on Palermo Mine Geology, go to: 1) Malinconico, M. (1982) Stratigraphy and structure of the Southeastern Rumney 15 minute Quadrangle, New Hampshire. M.S. Thesis. Dartmouth College, Hanover, New Hampshire, 234 pp, or, 2) Nizamoff, J.W. (2006) The Mineralogy, Geochemistry & Phosphate Paragenesis of the Palermo #2 Pegmatite, North Groton, New Hampshire. M.S. Thesis. University of New Orleans, 168 pp.

GSNH ROCK AND MINERAL TALK BOXES

A reminder… as one of the many benefits of being a GSNH Member, is that you may borrow either of these "presentation" ready kits. The kits contain good hand-sized specimens of rocks and minerals, posters, and background information for the presenter. All you have to do is review the kit and give the presentation. All the "visuals" / examples have already been put together for you. So the next time you have to give a talk to a local school, scout or civic group, etc., contact Lee Wilder, Public Outreach Coordinator for the NH Geological Survey at: 29 Hazen Drive, P.O.Box 95, Concord, NH 03302-0095 geology@des.state.nh.us or call 603.271-1976. Thanks to the NHGS, the GSNH stores these kits at the office in Concord, NH. Lee can sign out a kit to you and arrange for you to pick it up.

AIPG 2009 SCHOLARSHIPS AVAILABLE

The American Institute of Professional Geologists (AIPG) National Scholarship Program has scholarships that can assist students with college education costs and to promote student participation in the AIPG. Up to four scholarships ($1,000 each) will be awarded and can be used for tuition and/or room and board. Students who are declared undergraduate geological sciences majors who are at least sophomores and that attend a college or university in the U.S are eligible to apply Also, the student must be either a student member of AIPG or must have applied for student membership at the time the application for the scholarship is submitted. Awards are base don content and creativity. To apply, the applicants must submit: a letter of interest with name, mail and e-mail addresses, and telephone number; proof of enrollment in an eligible geological sciences program, transcripts; an original one-page essay on why the applicant wants to become a geologist; and a letter of support from a faculty member familiar with the applicant's academic work. Upon award, each award winner will be required to prepare a 600 to 800 word article for publication in The Professional Geologist. The subject of the article must be related to a timely professional issue. The deadline fro applications is February 15, 2009. Send in your application to: American Institute of Professional Geologists, Attention: Education Committee Chairman, 1400 W. 122nd Avenue, Suite 250, Westminster, Colorado 80234. For questions regarding the application process call (303) 412-6205 or e-mail: aipg@aipg.org.

NINTH ANNUAL NEW ENGLAND GROUNDWATER TEACHER INSTITUTE

On July 21-22 last summer, the American Ground Water Trust (AGWT) held its ninth annual New England Ground Water Institute for Teachers. The Institute has been held at many locations with tangible examples demonstrating the valuable presence of ground water in our daily lives. This year it was a pleasure for 20 science teachers from middle and high schools

from across the region to access the excellent education facilities and staff at the Tsongas Industrial History Center/Umass-Lowell. The AGWT offers the Institute experience free to teachers through sponsorship support from ground water businesses, organizations and individuals (Institute donations and teacher recommendations are always needed!). Offering the training for free removes school district budgetary barriers that frequently prevent teachers from attending worthwhile professional development programs.

The GSNH helped subsidize part of the cost for three New Hampshire science teachers at the Institute. The grateful teachers included Julie Brassard of St Thomas Aquinas in Derry, Chris Schadler Spaulding High School in Rochester and Cameron Temple of Franklin Middle School in Franklin.

The AGWT mission is to protect America's ground water, promote awareness of the environmental and economic importance of ground water and provide accurate science-based information to assist the public and decision makers in water resources issues. The AGWT recognizes the role of teachers in community education concerning water issues. However, statistics show that most new teachers and many veteran teachers have virtually no experience in ground water science. Attending an Institute removes this concern by presenting technical concepts and information through presentations reinforced with demonstrations, activities and hands-on experiences from scientists and industry professionals.

The instructors for each Institute are educators themselves or are ground water professionals with hands-on experience in the field. Through class sessions, field trips, demonstrations, discussions and handouts, teachers learn how to integrate fascinating ground water subject matter into existing curriculum.

Several members of the GSNH have generously donated their time and expertise at past Institutes making presentations highlighting ground water science in real life situations. This year marks the third Institute Mike Burke and Tom Mack have supported the AGWT Institute by giving presentations. Mike's presentations have focused on remediation of contaminated ground water through case studies. In each presentation, Mike focused on contamination originating from a neighborhood retail-gasoline station. He covered how contaminated ground water is found; what methods and technologies are available to clean up gasoline in ground water; and how long it takes to clean up ground water contamination.

This year, the two-day Institute program began with a session led by Garret Graaskamp of the AGWT on fundamental ground water and water resource science concepts and vocabulary. Tom Mack of the USGS then provided local context by describing the various aquifer types in New England and the intimate relationship of surface and ground water based on his recent ground water modeling work in southeastern New Hampshire. Later presenters spoke about gasoline remediation (Mike Burke, JGI Eastern, Inc), water treatment science and techniques common to New England (Christine Fletcher, Secondwind Water Systems), and the chemistry of water from a "green" perspective (John Warner, Warner Babcock Institute for Green Chemistry).

On the second day, Lise Marx with the Massachusetts Water Resources Authority described metropolitan Boston's increase in water use and the paralleling growth of the supporting reservoir system that has occurred in the last two centuries. She pointed out the positive affect of conservation measures on creating a more sustainable use pattern during the last decade. The remainder of the morning was spent enjoying a cruise of the historic Lowell industrial canals collecting water samples and doing field tests of basic water parameters. After lunch, Tim LaVallee of the Tsongas Industrial History Center, lead the teachers in an evaluation of maps and historic canal photos to trace the cause and effect of the inadequate sanitation methods that led to the Lowell typhoid epidemic of 1890. Hands-on ground water modeling examples filled the rest of the afternoon as the teachers participated in sand-tank demonstrations and basic Mod-Flow computer activities.

SEARCH FOR THE LARGEST (AND OTHERWISE SIGNIFICANT) BOULDERS IN THE NORTHEAST

Submitted by Ernst H. Kastning, Ph.D., P.G., and Lee Wilder, New Hampshire Geological Survey

Lee Wilder and I (both at the New Hampshire Geological Survey) have been inventorying and collecting information on record-size or otherwise notable boulders in New Hampshire. As an extension, we have been listing large and significant boulders in other states as well. We would like to hear about any superlative boulders in New England. Some may be glacially deposited boulders, including erratics. Others may be talus blocks that have fallen from cliffs or mountain sides, residual boulders, or accumulations of colluvial blocks in valleys. It is likely that most, if not all, of the largest and most interesting boulders will have a glacial origin to at least some degree.

We would appreciate any information of notable large New England rocks, including their location, approximate dimensions, intactness, and mode of origin (if known). We will compile a list with a tentative size ranking. Rocks that are important for reasons other than size are also of interest. This includes historically significant boulders (or rocks) or simply those that are unusual in their physical attributes (boulders harboring caves, balanced rocks, sculpted rocks, compositionally interesting boulders, natural likenesses, etc.).

By the way, to begin the quest, currently the largest identified boulder in the northeast (New York and New England combined) appears to be the Madison Boulder in the Town of Madison, Carroll County, New Hampshire. This is a New Hampshire State Park Natural Area and information on this boulder is available at http://www.newhampshire.com/state-parks/madison-boulder-natural-area.aspx. Do you know of any competitive candidates? If you do please contact either Ernst Kastning (at Ernst.Kastning@des.nh.gov) and/or Lee Wilder at (Leland.Wilder@des.nh.gov).

NHGS FALL GROUNDWATER LEVELS

Ground-water level measurements for September, October and November 2008 were collected by NHGS staff members Genevieve Al-Egaily and/or Kristen Svendsen.

September 24 - 26th: The statewide average ground-water level showed a 0.48-foot decrease from August. When compared with September 2007, the statewide average ground water level increased 1.12 feet. Increases were seen in all wells except for Colebrook, which showed a decrease of 0.89 feet.

October 27 - 30th: The statewide average ground-water level showed a 0.37-foot increase from September. When compared with October 2007, the statewide average ground water level increased 1.28 feet. Increases were seen in all wells except for Lisbon, which showed a decrease of 0.44 feet.

November 24-27th: The statewide average ground-water level showed a 0.11-foot increase from October. When compared with November 2007, the statewide average ground water level increased 0.79 feet.

If you would like to view historical groundwater data, http://nh.water.usgs.gov/WaterData.

USGS WATER-QUALITY INFORMATION COMPATIBLE WITH EPA

Water-quality data from the National Water Information System (NWIS) of the U.S. Geological Survey (USGS) can now be accessed online in a format compatible with the U.S. Environmental Protection Agency's (USEPA) data in the Storage and Retrieval (STORET) water-quality system. This new water-quality web service is an integral part of the USGS mission to disseminate to the public water information in a reliable, impartial and timely fashion that is needed to understand the Nation's water resources (http://water.usgs.gov/data).

The USGS water-quality web service provides data from the NWISweb database (http://waterdata.usgs.gov/nwis), which hosts 4.3 million samples and 72 million results representing approximately 368,000 sites across the United States from over a century of monitoring. The USEPA water-quality web service provides data from the STORET data warehouse that contains biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, Indian Tribes, volunteer groups, academics, and others (http://www.epa.gov/storet/web_services.html). All 50 States, territories, and jurisdictions of the U.S. are represented.

Scientists, water managers, and others interested water quality data users can retrieve USGS data in a format that can be easily merged with USEPA data for detailed analyses and modeling purposes. The results include discrete provisional and finalized results of physical, chemical, biological, and other descriptive water-quality characteristics using comparable naming conventions. Several file formats are available from the web services including Extensible Markup Language (XML), tab-delimited text, Microsoft Excel and Google Earth Keyhole Markup Language (KML).. To access the USGS water-quality web service, please go to http://qwwebservices.usgs.gov or www.usgs.gov.

OLDEST ROCKS ON EARTH FOUND

Recently scientists have identified that the oldest rocks on Earth are 4.28 billion years old, making them 250 million years more ancient than any previously discovered rocks. The rocks known as - *the Nuvvuagittuq greenstone belt* - are exposed on the eastern shore of Hudson Bay in northern Quebec and were found by geologists in 2001. These rocks are suspected to be from one of the earliest periods of Earth's history. Isotope dating of the rare earth elements *neodymium* and *samarium* in the rock samples from the *Nuvvuagittuq greenstone belt* determined the rock samples to be between 3.8 and 4.28 billion years old. The rock samples come from rocks that geologists call "faux amphibolite," and are thought to be ancient volcanic deposits. The rock samples from the *Nuvvuagittuq greenstone belt* are older than the previously oldest known rocks which are 4.03 billion years old associated with the Acasta Gneiss in Canada's Northwest Territories and older than 4.36 billion year old highly resistant zicon minerals from Western Australia. The Nuvvuagittuq greenstone rocks were dated by geologists at the Carnegie Institution and a Ph.D. student from McGill University in Montreal. The findings of their research are detailed in the September issue of *Science*.

UPCOMING EVENTS AND DATES TO REMEMBER

January 8, 2008: GSNH Winter Meeting at Cat-n-Fiddle Restaurant.

March 22-24, 2009: GSA Northeast Sectional Meeting, Portland, Maine

GEO PHOTOS

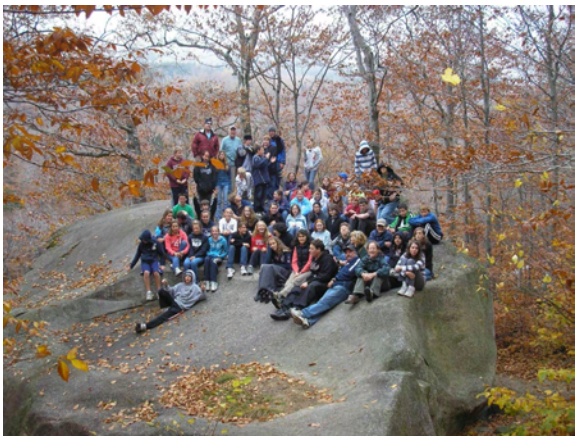

Photo Left: The students, instructors and trip leaders who attended the 10/14/08 Profile Middle School Earth Science Field Trip, sitting on Boise Rock, in celebration of Earth Science Week 2008 “No Child Left

Photo Below:
GSNH Members at the Fall 2008 Annual Dinner at the Cat-N-Fiddle

Photo Left: The Throne Room at the Palermo Mine.
Photo: Courtesy of Julie Spencer

Geological Society of New Hampshire

2009 WINTER DINNER MEETING

"Climate Change: Perspective, Surprises, Opportunities"

Speaker: Paul A. Mayewski, Ph.D.
Director and Professor, Climate Change Institute
Professor, Dept. of Earth Sciences, University of Maine, Orono

Dr. Mayewski's primary research interests are climate change and change in the chemistry of the atmosphere. He has pursued these interests by collecting snow samples and ice cores from throughout Antarctica, the Arctic, Andes, New Zealand and the Himalayas and Tibetan Plateau. Paul will explain what is climate, why does climate change and how fast does it change. Have humans impacted climate? How small a change in climate is important? Is recent climate change part of a natural process or in a "new state"? What do we do next? Where do we go next?

Thursday, January 8, 2009

Cat-n-Fiddle Restaurant

Exit 13, I-93, Manchester Street, Concord, NH

6:00 pm Social Hour, 7:00 pm Buffet Dinner, 7:45 pm Speakers

GSNH 2009 Winter Dinner Meeting, Thursday, January 8, 2009

Advance Reservations: _____Member (Dues Paid) @ $22.00.

- Member at the Door or Non-Member with Reservation ($24.00).
- Non-Member without Reservation ($26.00).
- Students $10.00 with valid student ID card (Reservation Requested).

Note: GSNH will also accept dinner reservations by e-mail, which will then allow you to pay at the door. Please note that e-mail reservations constitute an agreement with the Society for which you will be responsible to pay, whether you are able to attend or not, unless you cancel your reservation by noon the day before the Dinner.

Reservations will be taken until Monday, January 5, 2009! Checks payable to GSNH.

Mail to: Lee Wilder, 477 Putney Hill Road, Hopkinton, NH 03229. Reply via e-mail to: boslwne@tds.net

Name(s):_____

Address:_____

Phone and/or Email:_____

Half the cost of the dinner may be tax-deductible as a business expense. **The lecture part of the program counts as 1.5 hours of CEU contact hour credit.**

Geological Society of New Hampshire
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