



October, 2004
Volume 30
Number 3

THE PRESIDENT'S MESSAGE

This will mark my last Newsletter entry as President of GSM. Thanks to all of you for making it such a rewarding two-year term. Every endeavor was accomplished with teamwork and I want to especially thank Tom Weddle (V.P.), Dan Belknap (Newsletter Editor), Liz Champeon (past Treasurer), Rob Peale (current Treasurer), Pat Seward (past Secretary), Sean Dougherty (current Secretary), Art Hussey (Historian) and the Directors for all their time and effort. Thank you as well to Steve Dickson (MGS) and Peter Thompson (NHGS) for leading great fieldtrips this summer.

My primary goal as President was to foster greater communication among the various segments of our community. Geology is an inherently varied discipline. It is difficult to keep on top of the latest research in one's own subdiscipline, let alone trying to follow the science in another. That, combined with the variety of work platforms in which to use that knowledge (academia, governmental agencies, the consulting sector), leads to the further segmentation of our profession.

One of the ways we sought to combat that trend was to offer more opportunities for "cross-talk." In October 2003 we offered a Geology of Maine course hosted at Bates. It was a day-long event that attracted people from every segment of our membership – including the public. In addition, we decided to hold mini-symposia during the fall meetings to hear more from the consulting and regulatory sectors. For our newsletters, we asked members to submit brief articles describing their work. GSM also co-sponsored both the 2004 EPA-NGWA and 2004 NEIGC meetings. These events, in conjunction with the joint GSM-GSNH summer field trips and our traditional student-led spring meetings provided good opportunities for all of us to learn more about geological work outside of our immediate disciplines.

A few administrative changes were also made during the past two years. The annual membership fees were increased from \$7 to \$12 in order to cover the Society's yearly operating costs. Up until that point, the Society had to rely on the proceeds of a short course, offered every few years, to replenish the coffers. Although functional, the Council agreed that it was unfair to continually rely on a dozen people to generate money for the entire membership. We also updated the bylaws to formally reflect past changes and current practice, and to culminate them in a formal, accessible, document. Lastly, we redesigned the website, included information on Maine geology, and hired a webmaster so that meeting announcements and other postings could be made more efficiently. Once again, our goal through all of this was to foster better communication.

As always, there is still more to do. Portions of the website (especially the Links, Publications for Sale and Photo Archive) need work. Additionally, the database of geological equipment and resources in the state still needs to be developed – perhaps something that I will work on as a Director. And we still need to come up with a formalized roster of host institutions for the Spring Meeting. But, overall I think we squeezed in a lot during these past two years and I thank you all once again for making it happen.

Lisa Churchill-Dickson, President (2002-2004)
paleo@gwi.net

THE EDITOR'S MESSAGE:

Please send any items from individuals, schools or organizations for inclusion in the Newsletter to my e-mail address. Thanks.

Dan Belknap, Newsletter Editor (1998-present)
<belknap@maine.edu> (207) 581-2159, FAX: -2202

GSM WEBSITE

www.gsmmaine.org

The GSM website contains copies of present and archived Newsletters, a calendar of events, and other items of interest to the Society, including the updated Bylaws. There are many important links to geology items in Maine and elsewhere. There is a page on Maine geology and the Photo of the Month. Let us know what you think.

Webmaster, Mike Lerley
<mike@rentageekme.com>



2004 GSM Fall Meeting

October 29th, 2 p.m. to 8 p.m.
Poland Spring Inn, 41 Ricker Road (off Rt. 26),
Poland, ME

This year's meeting is being hosted by Kristin Tardif of the Perrier Group/Poland Spring.

******If you are planning to attend, please contact
Lisa Churchill-Dickson****
at paleo@gwi.net ASAP so we can get a
headcount for dinner.**

2 p.m. to 4 p.m. Mini-Symposium – Regulating Maine's Resources

2:00 – Mark Stebbins (MDEP): Mining Operations and Excavations for Borrow, Clay, Topsoil and Silt

2:30 – Gregg Wood (MDEP): Surface and Subsurface Waste Water Disposal

3:00 – John Hopeck (MDEP): Impacts of Stormwater Infiltration on Groundwater Quality

3:30 – Richard Heath (MDEP): The Story of the Environmental and Groundwater Analysis Database (EGAD)

4 p.m. to 5 p.m. Business Meeting - Agenda includes election of new officers.

5 p.m. to 6 p.m. Social Hour

6 p.m. to 7 p.m. Dinner – complimentary meal provided by Poland Spring

7 p.m. to 8 p.m. Keynote Address - Robert Gerber (Stratex, LLC) - The use of a variety of modeling techniques to study contaminant fate and transport at the Maine Yankee Nuclear Plant Site

The museum at Poland Spring will also be open during the meeting for anyone wishing to tour the exhibits



THE STATE GEOLOGIST'S MESSAGE

Although Maine is no longer in a drought, water issues continue in the news, whether it's a proposal to pump groundwater in Pierce Pond Township, to tax bottled water, or to ship Maine water to New Mexico in railcars. In response to numerous requests to my office for information on Maine's water resources, I've compiled a few facts to put Maine's resources in perspective. Here are a few:

Some Water Facts

- Average annual rainfall: 42 inches. Equivalent to 73,500,000 acre-feet or 24 trillion gallons statewide.
- Run-off: About 50% of precipitation, or about 12 trillion gallons, runs off the landscape in streams and rivers.
- Evaporation/transpiration: About 30-40% of rainfall evaporates or is transpired through vegetation. This equals about 7-10 trillion gallons.
- Infiltration to groundwater: About 10-20% of precipitation infiltrates to recharge groundwater. This is about 2-5 trillion gallons annually.
- Mapped sand and gravel aquifers occupy about 1,300 sq. mi. of Maine's landscape. Average annual recharge to these aquifers is about 240 billion gallons.
- One inch of Sebago Lake contains about 800 million gallons of water.

- Sebago Lake is the public water supply for about 200,000 people, serving them with about 8.5 billion gallons annually (about 10 inches of Sebago Lake water).
- Bottled water producers in Maine use about 500 million gallons of water each year.
- Some large blueberry growers irrigate with nearly 400 million gallons during dry years.

Aquifers

Many people perceive an aquifer is as a single, confined geological unit that underlies a vast area but has a limited recharge area. This type of aquifer is typical in the western United States but is not representative of Maine aquifers. Groundwater occurs in Maine in two primary kinds of aquifers, (1) sand and gravel, and (2) bedrock.

Sand and gravel aquifers: these are unconsolidated sand and gravel deposits, most of which were deposited during the last glacial episode which ended about 14,000 – 11,000 years ago. These deposits have excellent porosity and permeability that make them significant groundwater resources in the state. Because they formed as water melted from the glaciers, they are found only in limited areas around the state. Sand and gravel aquifers are recharged locally by precipitation.

Bedrock aquifer: The entire state of Maine is underlain with bedrock composed of igneous and metamorphic rock. Almost everywhere, this bedrock is fractured due to the many geological processes the rocks have endured since they formed between 360 and 650 million years ago. The fractures in the rock provide the porosity through which groundwater flows. Fractured bedrock in Maine is recharged locally.

Groundwater recharge

In Maine groundwater levels fluctuate systematically throughout the year as the resource is recharged in the spring from runoff and rain. Groundwater levels decline during the summer and fall as available precipitation is consumed by evapotranspiration processes, and groundwater in storage flows into surface water. Annual

fluctuations on the order of 3-4 feet are typical for many wells in the monitoring network maintained by the USGS. Long-term records show that groundwater levels have neither declined nor increased significantly.

This is in sharp contrast to aquifers in the western United States, for example the Ogallala aquifer that extends from the Texas panhandle to South Dakota. About 30 percent of the ground water used for irrigation in the U.S. is pumped from this aquifer, about 14 billion gallons per day in 1990. It is also an important public water supply, serving 2.2 million people with 332 million gallons per day in 1990. In an area that receives less than 15 inches of rain annually, this rate of use greatly exceeds recharge, resulting in groundwater mining. In some areas the water level has declined over 150 feet.

Conclusion

Water in Maine is an abundant, continuously renewable natural resource that, with careful stewardship, can be used to support a variety of economic activities.

Robert G. Marvinney, Maine State Geologist:

<Robert.G.Marvinney@state.me.us>

GSM MEMBER NEWS

Mark Cenci reports on recent staff comings and goings at Sweet Associates. **Andrew Gobiell** (Boston College) joined the company last year as a geologist. **Colby Smith** (UMO) joined the firm last winter, and left in August to pursue his doctorate. **Matthew Engelman** (Bates College) has been with Sweet Associates for several years and now heads the affiliate company, Aeration Systems, designing and fabricating aerating wastewater treatment products. **Bethany Thienel** (Bates College) was with the company for two years before leaving this spring to travel to New Zealand.

Congratulations to **Rachel Beane**, who has been awarded tenure and promotion to Associate Professor of Geology at Bowdoin College.

In May 2004, **Lissa Robinson** received a graduate degree in Community Planning and Development at the Muskie School of Public Service in Portland. For her capstone project, Lissa examined the relationship between residential density and groundwater quality. One goal of the work is to remove potential obstacles to dense residential development by clarifying risks to groundwater as a drinking water source.

Fred Beck was the fastest runner in his age group in the recent Peoples Beach to Beacon 10k road race, as well as at the Yarmouth Clam Festival race.

Hal Borns (UMO) recently received an NSF grant to support the project entitled "The Ice Age Trail in Maine: An Experience for Geo/Eco-travelers".

Peter Garrett (Emery & Garrett Groundwater, Inc.) is president of Kennebec Messalonskee Trails, Inc., which is seeking to build an 18-mile trail system for runners, bicyclists, walkers, and skiers along the Kennebec River and Messalonskee Stream. The group is launching a capital campaign this year to raise \$1.6 million over five years as local match money for federal funding of trail construction. Paul Newman, who spent time in the area last year filming "Empire Falls" donated \$10,000 earlier this year.

Please send member news to:

Carolyn Lepage, Member News Correspondent
(1996-present) <clepagegeo@aol.com> or
PO Box 1195, Auburn, ME 04211-1195 or
Fax: (207)-777-1370; Phone: (207)-777-1049

GSM SECRETARY'S REPORT

The 2004 summer field trip was held July 25th & 26th. Home base for the weekend was the beautiful Laudholm Farm, on the Wells National Estuarine Research Reserve, in Wells, Maine. The Reserve is a 1600-acre property with hiking/cross-country skiing trails, woodlands, wetlands, beach, and wildlife; well worth a visit.

The weekend got off to a rainy start with a talk by Steve Dickson, of the Maine Geological Survey, held in the Laudholm Barn. Steve talked about

changes of the Laudholm Beach and Wells Beach profiles which have occurred over the last several years.

After the primer, field trip attendees took a walk to Laudholm Beach to see evidence of sand erosion/migration first hand. In spite of heavy rains the talk was well attended; a testament to the hardy GSM membership. Laudholm and Wells Beaches are relatively heavily developed with residences, both seasonal and year round. Many of the houses are located directly on the beach or in the back-dune area. Due to natural and anthropogenically induced sand migration, many of these homes are at risk. Several attempts have been made to slow the process, including the construction of storm walls and artificial beach-sand replenishment. These are very temporary fixes that simply postpone the inevitable.

After Steve's talk, attendees wandered through the rain back to the Laudholm Barn to dry out and prepare for the afternoon (the bathroom hand dryers were especially popular at this time).

Members reconvened in the Laudholm Barn for a brief pre-trip talk by Peter Thompson, of the University of New Hampshire. Peter spoke about his bedrock mapping work in the vicinity of Acton and Lebanon, Maine. As the rains let up, people piled into vehicles to convoy to several outcroppings in the area. The major bedrock units in the quadrangle are the Rindgemere, the Gully Oven, and the Towow Formations. Peter led the group through the area, making stops at several excellent outcroppings, illustrating the variation across the quadrangle.

One of the most notable stops was the "Oven" –for which the Gully Oven Formation is named. The Oven is a heavily scoured area located in a small gorge. Local rock is a gray sillimanite schist and quartzite, with local coticule lenses. A walk through the gorge allowed close examination of the rock type, with good examples of coticule lenses and impressive erosional features.

Another popular stop was the former Acton/Lebanon Silver Mines. A short walk along the Little River led to several former mine pits with the associated tailings piles. Material here was Towow Formation: phyllites and fine-grained

schists. Attendees had a good time finding examples of mineralization in the quartz-rich tailings.

The day ended back at Laudholm Farm, where several people camped for the night at tent sites provided by the Farm. Those who stayed enjoyed the catered dinner and much dryer weather; a brief business meeting was held. Peter continued his trip on Sunday, stopping at several more locations. Thank you to both Steve and Peter for leading the equally informative and entertaining field trips.

Respectfully submitted,
Sean R. Dougherty, Secretary (2004)
<sean.dougherty@maine.gov>

GSM TREASURER'S REPORT

The Society currently has 344 members, distributed as follows:

Students:	55
Associates:	26
Regular:	253
Institutional:	12
TOTAL:	346

Total Paid Up 72

Previous Balance: Funds as of June 2, 2004

Anderson Fund Savings	\$ 397.29
Anderson Fund CD	\$ 5,000.00
Education Fund Savings	\$ 885.12
General Fund Savings	\$ 6,326.16
General Fund Checking	\$ 0.41
Total Funds	\$ 12,608.98

Receipts 6/02/04-10/22/04

Dues	\$ 755.00
Dividends	\$ 44.56
Dinner Fees	\$ 427.50
Publication Fees	\$ 12.00
Anderson Fund Donations	\$ 44.00
Receipts Subtotal	\$ 1,283.06

Expenses 6/02/04-10/22/04

Postage	\$ 2.96
Field Trip Dinner	\$ 521.87

Newsletter Printing (June '04)	\$ 376.94
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Expenses Subtotal	\$ 901.77
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Funds as of June 2, 2004

Anderson Fund Savings	\$ 446.54
Anderson Fund CD	\$ 5,018.19
Education Fund Savings	\$ 888.11
General Fund Savings	\$ 6,633.79
General Fund Checking	\$ 3.64

(Note: October dividends not included)

Total Funds	\$ 12,990.27
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Net gain or loss:	\$ 381.29
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Respectfully submitted,
Rob N. Peale, Treasurer (2004 -)
<Rob.N.Peale@maine.gov>

SOME USEFUL WEBSITES:

GSM Geological Society of Maine:

<http://www.gsmmaine.org/>

BATES COLLEGE:

<http://www.bates.edu/GEO.xml?dept=GEO>

BOWDOIN COLLEGE:

<http://academic.bowdoin.edu/geology/>

COLBY COLLEGE:

<http://www.colby.edu/geology/>

UNIVERSITY OF MAINE:

<http://www.geology.um.maine.edu/>

UNIV. MAINE FARMINGTON:

http://www.umf.maine.edu/academics/dept_natural.php?location=academics

UNIV. MAINE PRESQUE ISLE:

<http://www.umpi.maine.edu/programs/Scimat/>

UNIV. SOUTHERN MAINE:

<http://www.usm.maine.edu/~geos/>

MGS: Maine Geological Survey:

<http://www.state.me.us/doc/nrimc/mgs/mgs.htm>

MEDEP: Maine Dept. Environmental Protection

<http://www.maine.gov/dep/index.shtml>

MEMBERSHIP DUES STATEMENT

The **GEOLOGICAL SOCIETY OF MAINE, INC.** (often referred to as **GSM**) is a non-profit corporation established as an educational Society to advance the professional improvement of its members; to inform its members and others of current and planned geological programs in Maine; to encourage continuing social contact and dialog among geologists working in Maine; and to further public awareness and understanding of the geology of the State of Maine; and of the modern geological processes which affect the Maine landscape and the human environment.

The Society holds three meetings each year, in the late fall (Annual Meeting), early spring, and mid-summer (usually field trips). A newsletter, *The Maine Geologist*, is published for all members three times a year. The Society year runs from August 1 to July 31. Annual dues and gift or fund contributions to the Society are tax deductible. There are three classes of memberships:

\$12.00 REGULAR MEMBER	Graduate geologists, or equivalent, with one year of practice in geology, or with an advanced degree.	NOTE NEW FEE SCHEDULE AS OF August 1, 2003
\$12.00 INSTITUTIONAL MEMBER	Libraries, societies, agencies, businesses with interests in or practicing geology and related disciplines.	
\$10.00 ASSOCIATE MEMBER	Any person or organization desirous of association with the Society.	
\$ 5.00 STUDENT MEMBER	Persons currently enrolled as college or university students.	

THE GEOLOGICAL SOCIETY OF MAINE ANNUAL RENEWAL / APPLICATION FOR MEMBERSHIP

Regular Member	\$12.00	\$ _____	Name _____	Make checks payable to: Geological Society of Maine Rob Peale, Treasurer Maine Dept. Environmental Protection, State House Station 17 Augusta, ME 04333-0017
Institutional Members	\$12.00	\$ _____		
Associate Member	\$10.00	\$ _____	Address _____	
Student Member	\$ 5.00	\$ _____		
Contributions to GSM		\$ _____		
(please write gift or fund on check)				
TOTAL ENCLOSED		\$ _____	_____	

Email Address _____

(GSM funds include the Walter Anderson Fund ____, the Education Fund ____, and discretionary gifts ____ as noted by contributor)

----- 2004/2005 SOCIETY YEAR BEGINS AUGUST 1 - PLEASE SEND DUES TO TREASURER

THE GEOLOGICAL SOCIETY OF MAINE

c/o Daniel F. Belknap, Newsletter Editor
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THE MAINE GEOLOGIST is the Newsletter of the Geological Society of Maine, published three times a year, in mid-winter, summer, and early fall, for members and associates.

Return Service Requested

Correspondence about **membership** in the Society, **publications** and **dues** should be mailed to:

Rob Peale, Department of Environmental Protection
State House Station 17, Augusta, ME 04333-0017 <rob.n.peale@maine.gov>

Items for inclusion in the **Newsletter** may be directed to:

Daniel F. Belknap, Dept. Earth Sciences, University of Maine,
Orono, ME 04469-5790 <belknap@maine.edu>

President	Lisa Churchill-Dickson
Vice President	Tom Weddle
Secretary	Sean Dougherty
Treasurer	Rob Peale
Newsletter Editor	Dan Belknap
Directors	Walter Anderson (00-04) Dave Gibson (02-06) Liz Champeon (04-08)