

October, 2016 Volume 42 Number 2

THE PRESIDENT'S MESSAGE

Greetings! My term as president of GSM is rapidly coming to a close. It has been a pleasure to work with GSM's Executive Council and GSM volunteers. It takes a community of individuals to maintain GSM and provide programs and services to our state. I will continue as a Director of GSM for a few years. We will be voting in a new President and Vice-President at the Fall meeting.

Last summer we had a well planned, executed, and attended summer field trip. We stayed in a residence hall at Unity College and enjoyed several meals there including field trip banquet. The field trip covered an area from Belfast to Brooks, Maine. Dave West, Woody Thompson, Steve Pollock, and Roger Hooke collaborated on two full days of geology that included ground-truthing of late glacial features visible on LiDAR, friction melts along the Norumbega fault zone, a glaciomarine delta, a glacial esker, well-exposed outcrops showing the



Dave West – a welcoming guy

lithology, structural development and metamorphism of Maine's Paleozoic central coastal section, and a visit to the Mosquito Mountain Quarry in the Mt. Waldo granite. We saw some interesting geology and had some lively discussion in the field. Many thanks to the field trip organizers and to Bruce Hunter for all his efforts in managing arrangements with our Unity College hosts. We have posted a digital copy guidebook on our website.



Dave West, more in his element. If everyone would just crowd in a bit more, he wouldn't have to shout.

I would like to thank the officers and members of GSM's executive council one last time. Their effort and support have made all GSM's activities and events possible. I would also like to thank the membership of GSM for their participation and for spreading the word about GSM in the workplace and the classroom.

Martin Yates
President, GSM yates@maine.edu

GSM Fall Meeting

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GSM will be having its Fall 2016 meeting on November 18 at 1 pm at the Augusta Civic Center. The theme of this meeting will be geographic information systems (GIS) and new methods for digitizing and analyzing earth features. These topics should be of particular interest to our geology business community, but will also be of interest to students, educators and state geologists. Smith, a fluvial geomorphologist from the University of Maine, will be our keynote speaker and will speak on his research related to coastal watersheds. We will also have a representative from Blue Marble Geographics Inc. to describe the 'Global Mapper' GIS application. Chris Halsted and Amber Whittaker from the Maine Geological Survey will present talks on the use of ArcGIS Online and the use of Landsat images, respectively. Martha Nielson from the USGS will speak on estimating long-term annual recharge rates for the state of Maine using GIS. Finally. Nicholas Whiteman from the University of Maine will make a presentation on the use of a ranging technique called 'Structure from motion (SfM)' to characterize bluff erosion along coastal Maine. In addition to our GIS program we will have an opportunity to remember three members of our geology community that have passed away in the past year: Arthur Hussey, Phil Osberg, and Brad Hall (please see Member News, below). Hope to see you all there.

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#### THE EDITOR'S MESSAGE

The Newsletter is now distributed through e-mail in PDF format. Anyone with special needs please contact the Editor. Please send items of interest for the News from the Campuses and Member News columns, or other things you'd like to share.

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GSM WEBSITE: <a href="www.gsmmaine.org">www.gsmmaine.org</a> FACEBOOK: <a href="facebook.com/GSMMaine">facebook.com/GSMMaine</a>

# NEWS FROM THE STATE GEOLOGIST

#### Mining Rules – Round 3

Among the more divisive topics debated by the Maine Legislature in recent years are the DEP's Chapter 200 Metallic Mineral Mining rules. You will recall that the effort to revise mining statues and rules began with a bill submitted during the eleventh hour of the 2012 legislative session on behalf of the owners of the Bald Mountain VMS deposit in northern Maine. Among other provisions, the bill directed the DEP to revise the rules. Although the rules subsequently developed were twice defeated by the Legislature, a revision that addresses many of the major environmental concerns is now being reviewed by Maine's Board of Environmental Protection (BEP). While a scenic landscape image may be worth many dollars to an art collector, seeing a locality in person is priceless. In August, I took MGS Bedrock Geologist Henry Berry, BEP Member Tom Eastler, and several DEP staff to visit the Eagle Mine in northern Michigan, a large underground nickel and copper sulfide mine now in production in broadly analogous geology and climate to northern Maine's.



We visited this mine, meeting with both the Eagle Mine's environmental managers and the State of Michigan's mine regulators, because the Eagle Mine is recognized as a modern metallic mineral mine permitted under modern, stringent regulations, and one that is operating with an exemplary environmental record. In fact, this mine was highlighted by environmental advocates in floor debates in both the Maine House and Senate in June

2013 because it was permitted under very strict regulations, including a mine closure plan that eliminates the need for water treatment within five years of closure – shorter than the 10-year limit in the rules being reviewed by the BEP.

I took away three important points from that visit:

- 1) Mining of metallic sulfide minerals can be done responsibly in a northern temperate climate;
- 2) The proposed Chapter 200 mining rules currently before the BEP are stricter than Michigan's in important ways:
- The primary mining zone at the Eagle Mine is 1,000 feet directly beneath the Salmon Trout River, an important fish habitat in northern Michigan. Mining is underway without significant impact to the river. Water infiltration into the mine that must be pumped and processed through the water treatment plant is about 10 gallons per minute the equivalent of five garden hoses. Maine's proposed rules would prohibit mining beneath Great Ponds, rivers, and streams.
- The Humboldt Mill used to process ore from the Eagle Mine discharges tailings to a wet storage pond which will remain flooded after the mine is closed. It may be fortuitous that northern Michigan has many old iron open pit mines that may serve this purpose. Maine's proposed rules would prohibit wet tailings impoundments after mine closure.
- Michigan does not allow perpetual water treatment after a mine is closed, but the rules do not specify the length of time beyond which treatment is considered perpetual, leaving this critical determination to be considered on a case-by-case basis. The proposed Maine rules limit post-closure water treatment to 10 years, beyond which treatment is considered perpetual and is prohibited.
- 3) A successful process like Michigan's to develop modern mining statutes and rules begins with broad community engagement. This is perhaps the most important lesson from the Michigan visit and one where Maine has failed miserably. The late introduction in 2012 of the mining bill and the lack of engagement with stakeholders disenfranchised the environmental community and many citizens, setting the process off on the wrong foot from which it has yet to recover, if it will at all.

All of this was quite evident on September 15, 2016 when the BEP respectfully listened for five hours as dozens of opponents testified against these rules, often citing environmental problems at the Callahan and Second Pond mines while failing to acknowledge that those mines were active before any environmental regulations were in place. We heard about disastrous tailings dam failures, while no one spoke of modern society's voracious appetite for these materials – an appetite that is driving many mining operations to third-world countries where environmental regulations are lax. I spoke of the apparent success of the Eagle Mine and the important ways in which Maine's proposed rules are You can read all the stricter than Michigan's. testimony at:

#### http://www.maine.gov/dep/bep/featured.html

Several steps and opportunities for engagement remain in this process. Through several meetings, the BEP will further deliberate on the rules, making revisions before forwarding them in January to the Legislature for final approval. You can expect the debate in the next Legislature to be a painful, rancorous one. But it is an important debate in which more voices need to be heard. I encourage you to participate.

Robert G. Marvinney, State Geologist. Robert.G.Marvinney@maine.gov

## **GSM Member News**

We are sad to report the passing of three members of the Maine geology community who made life-long contributions to Maine geology, and the education of geology students.

### Arthur M. Hussey II

Arthur M. Hussey II, Professor of Geology Emeritus, died on July 26, 2016, in Bowdoinham, Maine.

Bowdoin College Professor of Geology Emeritus Arthur M. Hussey, 85, passed away peacefully on Tuesday evening, July 26, 2016. For much of his 39-year teaching career, Art was the sole faculty member in the Geology department, carrying on Bowdoin's rich history in a field in which the College's first science professor, Parker Cleaveland, played a prominent role. A dedicated field geologist and recognized authority on the structural

geology of the Appalachians and of Maine, Art also curated the James Bowdoin III and Parker Cleaveland mineral collections at the College.

Arthur Mekeel Hussey II was born in Pittsburgh March 9, 1931, and graduated from Wells High School in Maine in 1950. He traced his interest in geology to his childhood, when he played with (and studied) the gravel along the sea wall near his grandfather's house in Wells Beach. He earned a B.S. in geology and mineralogy at Pennsylvania State University in 1954, where he won the W.A. Tarr Award for scholarship in the Earth sciences. His graduate study at Harvard was interrupted by service as a first lieutenant in the U. S. Air Force from 1955 to 1957. He continued his graduate study at the University of Illinois, and was awarded his Ph.D. in 1961. He was a visiting Assistant Professor at Purdue University in the 1960-61 year.

He joined the Bowdoin faculty in 1961 as a Visiting Assistant Professor of geology, became an Assistant Professor in 1962 and an Associate Professor in 1966. He was promoted to the rank of Professor in 1972. Beginning in 1958, he worked with the Maine Geological Survey to map the structural geology of the Maine coast from Kittery to Pemaquid Point. Art was a co-editor of the Bedrock Geological Map of Maine (1985) by the Maine Geological Survey, a comprehensive survey of the state's rock formations and geologic history. His book A Guide to the Geology of Southwestern Maine was published in 2015, and summarized nearly sixty years of his research.

The author of scores of papers and maps on the geology of Maine, Art remained professionally active until the time of his death. He had co-authored a paper for a New England Intercollegiate Geological Conference field trip scheduled for this fall, and he would have been at the front of the group, sharing his knowledge about the deep history of a landscape he knew so well. Art was a lecturer and scientific consultant on many statewide geologic projects, ranging from mapping the bottom of Casco Bay to tracing seismic movements along Maine fault lines. When the College undertook the repair and reconstruction of the two Chapel towers in 2003 and needed to replace a number of stones, Art drew on his detailed knowledge of local geology to identify the quarry that produced the original stones. Always a teacher, Art led field trips for geologists, students, and the general public to acquaint others with the wonders of Maine's geological history.

Art took great pride in his students and their accomplishments. At the time of his retirement, the Arthur M. Hussey II Prize in Earth and Oceanographic Science was established at the College to recognize an outstanding senior research project. He was a long-time member of the Geological Society of America, the New England Intercollegiate Geological Conference, and a board member of the Maine Mineral and Gem Museum in

Bethel. The Geological Society of Maine was formed during an informal meeting of colleagues in Art's barn in Bowdoinham in 1974, and he served as the organization's first president and publications editor. He also served as a member of the Topsham School Board in 1971. Some at Bowdoin may not have known about Art's passion for narrow gauge railroads and his volunteer work as a conductor for the Maine Narrow Gauge Railroad Company.

Art is survived by his children, Arthur M. Hussey III of Fairbanks, Alaska, Nathaniel Hussey of Matinicus, Maine; Mary Hussey Stride of Bowdoinham, Maine; several grandchildren; and his former wife, Ruby Lord Hussey.

We share with Art's family, colleagues, former students, and friends a deep sense of loss at his passing.

#### Slightly edited from:

http://obituaries.bowdoin.edu/arthur-m-hussey-iii/#more-5093

There was a memorial for Art on September 25 at the Bowdoin College Memorial Union. More than 100 friends, family and colleagues attended to share reminiscences of his life and accomplishments. Notable accolades were provided by former State Geologist Walter Anderson and current State Geologist Bob Marvinney. Approximately 10 GSM members attended, with several also speaking at the gathering. Dan Belknap: on a personal note, Art was very important to me, as the Bowdoin professor who opened my mind to geology, and remained a good friend for life. He was without doubt the best college teacher I've ever encountered.

## **Bradford Allyn Hall**

Bradford Allyn Hall, PhD, 83, died after a brief illness on July 11, 2016, at Eastern Maine Medical Center. He was born April 7, 1933, the son of Milton Bradford Hall and Minna Schultz Hall of Rehoboth, Massachusetts.

Brad graduated from Providence Country Day School and earned a BS in Geology at the University of Maine, an MS from Brown University and a PhD from Yale University. He joined the Department of Geology at the University of Maine and spent his career teaching, conducting research, mentoring graduate students and chairing the Department of Geological Sciences before retiring as professor emeritus.

From an early age, Brad spent summers with his parents on Munsungun Lake, where they owned the Bradford Camps, sporting camps in the true tradition of the North Maine Woods. By the age of fifteen he had

earned his pilot's license and enjoyed flying float planes. Brad's knowledge of the woods was vast and his love for the region clearly figured into his career choice of geology, including his doctoral thesis project mapping the geology of northern Maine.

While an undergraduate at the University of Maine, he met his future wife, RoseAnne Greenlaw of Presque Isle, Maine. They married in 1955 and she joined him in Germany, where he was deployed with post-World War II occupation forces. After his discharge from service, Brad resumed his graduate education and along with his devoted partner raised two children, Anne Hall of Washington, D.C., and Sue Hall Rodgers of Littleton, Colorado.

Brad was proud to serve as the Chairman of Geological Science at the University of Maine for several years. His research in the Antarctic, India, Eastern Europe and Southern Africa provided many exciting stories and memories for his family over the years, inspiring his daughter Anne to join the Foreign Service. Hall Rock, Victoria Land, Antarctica, was named for him in 1971.

Following his retirement, Brad pursued his multitude of interests, including fly fishing for Atlantic salmon, traveling around the world to visit his daughters, reading, researching new projects, gardening, woodworking, cooking and more. Much of his time continued to be spent on Munsungun Lake, often with his family and his beloved Airedale Terriers. Brad's life remained full and productive until just days before his passing.

He was predeceased by his parents; and is survived by his wife, daughters; son-in-law, Scott; and grandchildren, Emma Bradford and Peter Cushing Rodgers.

Tributes to Brad may be done in the manner of one's choosing. Condolences to the family may be expressed at <a href="https://www.BrookingsSmith.com">www.BrookingsSmith.com</a>.

Slightly edited from: Bangor Daily News, Wednesday, July 20, 2016

Several GSM members kept the e-mail

Several GSM members kept the e-mails humming to inform Brad's friends and colleagues of his passing, and to share stories. As usual, Walter Anderson was message central in these efforts.

Gary Boone writes: I regard Brad's mapping in his deeply held stomping grounds of Munsungan as a remarkable achievement - almost half the size of Connecticut. It's fitting that ChunZeng and Steve Pollock will continue Brad's work into the Winterville Volcanics.

**Steve Pollock** writes: A recognition of Brad's contributions is very much appropriate. In the 70's and 80's Brad made quite a contribution to northern Maine geology. His volume on the Munsungun

Anticlinorium has been exceptionally helpful for the mapping that Dinyi and I are doing this summer. I was at UMPI a couple of weeks ago in the GIS lab there, and lo and behold they had a scanned color version of a part of his map on one of the tables.

Hal Borns writes: Bradford Hall is very well known to geologists here in the Northeast for his excellent stratigraphic work on the Munsungun Anticlinorium of northern Maine. I knew Brad as a colleague and friend in the University of Maine's Department of Geological Sciences. However, I also knew Brad as a research colleague applying his stratigraphic abilities in my field of Glacial Geology.

Together we began a program to examine evidence for southern hemisphere Gondwana Glaciation. I invited Brad to participate in my NSF grant to examine a reported Jurassic-age tillite in Antarctica. There were no other Jurassic tillites reported from anywhere in the world. As it turned out this "tillite" was a 1000-foot thick lahar!

We examined Gondwana "tillites" at classic sites in South Africa, Lesotho and India, over several field seasons in the 1960's and 70's. We concluded that some of the "tillites" were, in reality, "lahars," while many, especially in central India, were not primary tills, but tills re-worked as submarine landslides.

I look back with fond memories of the excitement and the trials and tribulations that Brad and I encountered on these world travels.

## Philip H. Osberg

ORONO - Philip H. Osberg, 91, was a Professor of Geology at the University of Maine in Orono, 1957-1990. He was the son of Henry Osberg and Olive Walton, and was born October 23, 1924, in Melrose, Massachusetts. He passed away September 30, 2016, just four months after his wife Priscilla.

His interest was chemistry at Dartmouth College from 1942-43 when he began military training. He joined the Navy for World War II as a second officer manning PT boats. He was stationed in the Philippines and in Hawaii. He could navigate by the stars. His wife, Priscilla, said he was the only one qualified to bring a PT boat back home across the Pacific and through the Panama Canal when the war ended. He returned to Dartmouth, switched his major to Geology and met Priscilla. They were married on August 14, 1948. She supported him while he went to Harvard. They celebrated 68 years of marriage.

As a young man, Philip was an avid skier and could be seen in photos flying over a ski jump in the White Mountains. He taught his whole family to ski, bringing the two kids to the slopes as soon as they could walk. After retirement he became a gardener and worked as a 'cleric of works' and on several committees at The Church of Universal Fellowship. He could be seen climbing the clock tower to wind the clock before it was automated. He and Priscilla enjoyed a splendid sailor's life along the coast of Maine in their boat Windsong.

In 1968, he was the Chairman of the Geology Department at the University of Maine and he helped focus the then new and small department on glacial and Quaternary geology with a multi-disciplinary focus. Formerly, he had taught at Pennsylvania State University and Colby College.

During the summers he worked for the Geological Survey in New England. He was first editor of the Bedrock Geologic Map of Maine published by the Maine Geological Survey in 1985. This remains the current summary map of Maine bedrock geology at 1:500,000. He published books, articles and geological maps, gleaned from his field trips in Maine and New England, striding through the wilderness with a rock hammer, looking at bedrock and taking copious notes. He made a contribution to the theory of Plate Tectonics and was a Fulbright scholar in Oslo, Norway, with later sabbaticals at Oxford, England and with the Geological Survey in Virginia. In his late 80s, Philip began writing an unfinished textbook book on how the earth really began. Both he and Priscilla lived and died in the house they built together in Orono, and are survived by their daughter Susan Osberg, son Peter Osberg, and grandson Mathew Osberg.

The Memorial Service was held Saturday October 8, 2016, at Riverside Cemetery, Bennoch Road, Orono.

Slightly edited from: Bangor Daily News, October 04, 2016

Steve Norton writes: Phil was a rigorous teacher of petrology and structural geology to the undergraduate and graduate students in the Department of Geology at the University of Maine. In the mid-1960's, as Chair of the department, he successfully argued with the University administration that the department should be permitted to transition from a predominantly teaching department to a balance of teaching and research. He was adamant about accountability because department's future rested on productivity. Under his leadership, the department elected to have a strong presence in Quaternary geology, with initial staffing beginning in 1969. That vision grew into the Climate Change Institute and several smaller foci of strength. Phil was the principal editor of the state bedrock map of Maine (1985). At the time of his death he was working on a synthesis of the geology of the northeastern Appalachian Mountain system. He and his recently deceased wife, Priscilla, were warm and supportive parents of their two children, Susan and Peter. His colleagues and students extend sincere condolences to them.

Henry Berry (1986 M.S., UMaine) writes: Phil Osberg was the preeminent New England bedrock geologist of the latter half of the 20th century. He was the ideal field geologist, athletic, methodical, well trained, and perceptive. His detailed mapping, combining astute observations with application of geologic principles, is beyond reproach. Decades of mapping projects in the Sutton Mountains, Quebec, Plainfield, MA, Waterville and Camden, Maine, gave him an unparalleled breadth of experience across the New England Appalachians. When the plate tectonic model revolutionized thinking in the mid-1970's, Osberg was at the forefront, as displayed in his few simple diagrams in a 1978 paper that divided New England into four tectonic plates. His encyclopedic knowledge of New England made him a central figure in the International Geologic Correlation Program (1974-1981) of the Applachian-Caledonide system from Alabama to Norway. He led the effort with Art Hussey and Gary Boone to integrate hundreds of geologic maps by 13 area compilers into the single Bedrock Geologic Map of Maine (1985), a geologic and artistic masterpiece. He was lead author of the comprehensive 53-page chapter on the Acadian Orogen in the Decade of North American Geology volume (1989). He was a master of New England bedrock stratigraphy, structural geology, and tectonics, conversant with findings from geophysics, paleontology, geochronology, and igneous and metamorphic petrology, equally comfortable working at scales from microscopic to continental. He was an intrepid field geologist, a scholar, and a critical thinker, faithful to the data and constrained by geologic principles. Phil Osberg was a geologist of and for his time. He served us well.

#### GSM SECRETARY'S REPORT

No report – see p. 1 for 2016 Summer Field Trip

Lisa Jacob, Secretary <u>ljj@smemaine.com</u> 207-829-5016

### **GSM TREASURER'S REPORT**

### Fiscal Year August 1, 2015 to July 31, 2016

|                                      | Actual         |
|--------------------------------------|----------------|
| Income                               |                |
| Dues Paid                            | \$<br>3,495.00 |
| Donations for Anderson Fund          | \$<br>220.00   |
| Other Income                         |                |
| Field Trip 2016 registrations        | \$<br>1000.00  |
| Subtotal                             | \$<br>4,715.00 |
|                                      |                |
| Expenses                             |                |
| Postal Stamps                        | \$<br>9.80     |
| Annual Corporate Report              | \$<br>35.00    |
| Meeting Expenses                     |                |
| Fall Meeting 2015                    | \$<br>1,459.40 |
| Spring Meeting 2016                  | \$<br>868.32   |
| Summer Field Trip 2015 paid in       | \$<br>216.81   |
| 2016                                 |                |
| Summer Field Trip 2016               | \$<br>1,497.00 |
| Anderson Fund Awards                 |                |
| UMaine Geology Club Field Trip       | \$<br>500.00   |
| E2 Tech sponsorship, Role of Science | \$<br>250.00   |
| in Public Policy Symposium           |                |
| Web site expenses                    | \$<br>90.07    |
| Subtotal                             | \$<br>4,926.40 |
|                                      |                |

#### Net Decrease \$ 211.40

#### End of Year Asset Summary July 31, 2016

| End of Teal Asset Summary July 21, 2010 |                                                                                   |  |  |
|-----------------------------------------|-----------------------------------------------------------------------------------|--|--|
| Sub-Account                             | July 31, 2016                                                                     |  |  |
|                                         |                                                                                   |  |  |
| Business Savings                        | \$ 1067.68                                                                        |  |  |
| Checking                                | \$ 2,394.51                                                                       |  |  |
| Total                                   | \$ 3,462.19                                                                       |  |  |
|                                         |                                                                                   |  |  |
| Business Savings                        | \$ 5.01                                                                           |  |  |
| 4 Certificates of                       | \$ 20,809.81                                                                      |  |  |
| Deposit                                 |                                                                                   |  |  |
| Total                                   | \$ 20,814.82                                                                      |  |  |
|                                         |                                                                                   |  |  |
| All Funds                               | \$ 24,277.01                                                                      |  |  |
|                                         |                                                                                   |  |  |
|                                         | \$0.00                                                                            |  |  |
|                                         | Business Savings Checking Total  Business Savings 4 Certificates of Deposit Total |  |  |

Respectfully submitted, October, 16, 2016 Bruce E. Hunter (Treasurer, 2016) bruce.e.hunter@gmail.com

### Additional summer field trip photos by Marty Yates:



Woody Thompson



Steve Pollock – on the Penobscot Formation



Steve Pollock, Fred Beck and Dave West

#### 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 modem 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 a field trip). A newsletter, *The Maine Geologist*, is published for all members three times a year. The Society year runs from Aug. 1 to Jul. 31. Annual dues and gift or fund contributions to the Society are tax deductible. There are four classes of memberships:

| \$ 20.00 REGULAR MEMBER       | Graduate geologists, or equivalent, with one year of          | FEE SCHEDULE |
|-------------------------------|---------------------------------------------------------------|--------------|
|                               | practice in geology, or with an advanced degree.              |              |
| \$ 20.00 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<br>Institutional Members                                                                     | \$ 20.00 \$<br>\$ 20.00 \$ | Name    |  | Make checks payable to:<br>Geological Society of Maine |  |  |
|-------------------------------------------------------------------------------------------------------------|----------------------------|---------|--|--------------------------------------------------------|--|--|
| Associate Member                                                                                            | \$ 10.00 \$                | Address |  | Bruce Hunter, GSM Treasurer                            |  |  |
| Student Member                                                                                              | \$ 5.00 \$                 | _       |  | 44 Old Fairgrounds Rd.                                 |  |  |
| Contributions to GSM                                                                                        | \$                         |         |  | Unity, ME 04355                                        |  |  |
| (please write gift or fund                                                                                  | d on check)                |         |  |                                                        |  |  |
| TOTAL ENCLOSED                                                                                              | \$                         |         |  |                                                        |  |  |
| Email Address (GSM funds include the Walter Anderson Fund, and discretionary gifts as noted by contributor) |                            |         |  |                                                        |  |  |

#### 2016/2017 SOCIETY YEAR BEGAN August 1 - PLEASE SEND DUES TO TREASURER.

#### THE GEOLOGICAL SOCIETY OF MAINE

c/o Daniel F. Belknap, Newsletter Editor School of Earth and Climate Sciences

111 Bryand Global Sciences Center

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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.

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

Bruce E. Hunter, <u>bruce.e.hunter@gmail.com</u>, GSM Treasurer, 44 Old Fairgrounds Rd., Readfield, ME 04355

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

Daniel F. Belknap, Dept. Earth Sciences, University of Maine,

Orono, ME 04469-5790 <br/> <br/> <br/> <br/> delknap@maine.edu>

| President         | Marty Yates   | (2016) | University of Maine, yates@maine.edu                           |
|-------------------|---------------|--------|----------------------------------------------------------------|
| Vice President    | Henry Berry   | (2016) | Maine Geological Survey, henry.n.berry@maine.edu               |
| Secretary         | Lisa Jacob    | (2016) | Sevee & Maher Engineers Inc., ljj@smemaine.com                 |
| Treasurer         | Bruce Hunter  | (2016) | Maine Dept. Environmental Protection, bruce.e.hunter@gmail.com |
| Newsletter Editor | Dan Belknap   | (2017) | University of Maine, belknap@maine.edu                         |
| Directors         | Chris Morrell | (2016) | R.W. Gillespie & Associates, Inc., cmorrell@rwg-a.com          |
|                   | Keith Taylor  | (2017) | St. Germain Collins, keitht@stgermaincollins.com               |
|                   | Steve Kelley  | (2018) | Haley & Aldrich, skelley@haleyaldrich.com                      |
|                   |               |        |                                                                |

## PLEASE PAY YOUR DUES