The Maine Geologist

NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MAINE

October 2019 Volume 45 Number 3

PRESIDENT'S MESSAGE

I hope you are all enjoying a beautiful fall wherever you are throughout the state or beyond. Writing from College of the Atlantic in Bar Harbor, ME, I can report that the foliage this season is spectacular; what a wonderful term to be teaching a field-based geology course! In my Rocks and Minerals course, the students appreciate the new samples I collected during an exciting summer GSM field trip to a few pegmatite quarries and surficial geology sites in southwestern Maine (read more about the field trip and see some photos within this newsletter and online)! I'm very grateful to the many people who helped organize and lead the field trip.

Throughout this last year, I have been thinking about how we, as members of a professional group, might maintain expertise and a discipline-focused network while at the same time foster interdisciplinary professional relationships.

Last March I participated in one of the NEGSA sessions on fostering interdisciplinary education through teaching about The Anthropocene. After presenting on my experience co-teaching with my colleague, an anthropologist, (one of the most challenging and most rewarding experience in my career), I listened to Dr. Don Siegel, the recently elected president of the GSA, articulate his encouragement to broaden ourselves as geologists by interacting and teaching with folks of other disciplines. He also spoke broadly about his worry that in the coming years we might expect to see reduced funding available to the geoscience community for basic scientific research and even research on topics in climate science. Instead, we should expect to see a shift towards funding focused on climate change adaptation efforts, for example moving water to the Southwest instead of trying to prevent shortages. It's too late to prevent water shortages in the Southwest, it's time to start thinking about how to move water to the Southwest, he explained. His message, I think, was to inspire us to think about ways to make our work relevant to the adaptation planning effort so as to remain capable of funding our research. To keep our work fundable and relevant, we need to collaborate and communicate across disciplines.

During April-June 2019, College of the Atlantic hosted the *Seminar on Climate Change Speaker Series*, a weekly lecture series tied to courses and open to the public, that highlights work in climate science as well as broader communication about climate change. This year, the speaker list included biogeochemists, artists, geologists, anthropologists, botanists, ecohydrologists, oceanographers, paleontologists, marine scientists, and environmental engineers. They were government workers, academics, researchers, and museum curators and exhibitors. All the speakers predicted difficult futures—globally and locally—some of which are already affecting coastal Maine communities. Presenting adaptation strategies and widespread, solution-focused communication efforts, most of the speakers also offered hope. They shared web-based resources, such as the Maine Flood Resilience Checklist discussed by geologist Peter Slovinsky of the Maine Geological Survey, and shared inspiring case studies of adaptation strategies in Maine and beyond.

After a motivating spring term interacting with so many different types of climate experts as well as reflecting on the messages from the NEGSA session on interdisciplinary education and communication, I feel more compelled than ever to form and foster

collaborations with members of the broad geoscience community (as we do through the GSM and other such groups) as well as professionals in other complementary disciplines. We have actionable work to do to train and collaborate with the next generation of scientists, civil servants, and communicators in order to continue both basic scientific research and work aimed at ensuring our present and future societal well-being.

In the last few weeks, Governor Janet Mills launched the Maine Climate Council, a diverse group tasked with creating a climate change action plan for the state that will reduce greenhouse gas emissions, monitor the effects of climate change in the Gulf of Maine, assist communities prepare for pending hazards (flooding, erosion, etc.), and assess the impacts of climate change on state-wide industry and Maine's economy. With such a huge effort underway at the state level, and broad connections to the geoscience community from industry to academia, this is a timely and relevant subject for the upcoming fall GSM meeting. The meeting will be held during the afternoon of **November 8** in Augusta. The topic will be *Climate Change Impacts and Adaptation in Maine* and we will hear about the plans and progress of the new Council as well as updates about climate change impacts and adaptation strategies from researchers and workers spanning different realms. Stay tuned for a list of speakers to be posted on the website soon. Hope to see you there!

Sarah Hall, GSM President
shall@coa.edu

THE EDITOR'S MESSAGE

The newsletter is distributed through email in pdf format. Anyone with special needs please contact the Editor. Please send items of interest and photographs of GSM activities to:

Amber Whittaker, Newsletter Editor
amber.h.whittaker@maine.gov

GSM WEBSITE: www.gsmmaine.org
FACEBOOK: facebook.com/GSMMaine

GSM FALL MEETING
NOVEMBER 8, 2019
AUGUSTA CIVIC CENTER

The fall meeting agenda is still in the works but will follow a similar format to previous meetings:

11:00-12:00	Executive Meeting
12:00-12:30	Set up
12:30-1:00	Registration
1:00-1:20	Business Meeting
1:30-5:00	Talks on the topic of climate change and adaptation planning in Maine
5:00-6:00	Social Hour

A full agenda with a list of speakers will be posted on the website before the meeting.

Sarah Hall, GSM President

NOTICE

Proposal to change GSM bylaws

A motion to amend the current GSM bylaws will be proposed at the 2019 Fall Meeting. GSM bylaws state, in Article IX, Section 1, that "The By-Laws of the Society may be altered or repealed by affirmative vote of two-thirds of the Society membership present at any scheduled meeting of the Society." Although the bylaws do not require advanced notice of an amendment to the bylaws, we are announcing the proposed change here. If you have any questions about this upcoming motion, please email a member of the Executive Council. Examples of past bylaw amendments include the addition of the Newsletter Editor as an officer (amendment accepted at the Fall Meeting of 1988) and addition of the Historian as an officer (amendment accepted at the Fall Meeting of 2003).

Proposed amendment: Adding Website Administrator as an officer of the Geological Society of Maine, and clarifying the language in Article VI, Section 3.

Proposer's name and rationale: Amber Whittaker, Newsletter Editor, proposes the change. The website is the public face of GSM and distributes key information to our membership. This addition will facilitate communication between the Website Administrator and the Executive Council and simplify update and creation of website content as we intend to increase use of the website – generally, it will be more efficient to have the Website Administrator attend the Executive Council meetings. This proposal is supported by the Executive Council, as discussed during a meeting on September 3, 2019.

During subsequent email discussion, the Council discovered that Article VI, Section 3 currently suggests that we elect officers at every annual meeting, which we do not do; this amendment also seeks to clarify the wording of this section. The terms of office are stated elsewhere (Article VII, Section 2 for officers, and Article VIII, Section 1 for councilors), and do not need to be repeated in this Section.

The current bylaws: Article VI, Section 3 currently reads: "At each annual meeting the membership shall elect six officers to two-year terms, and one council to a three-year term of office (Article VII, Officers, and Article VIII)." Article VII, Section 1 currently lists six officers of the Geological Society of Maine as follows: President, Vice-President, Secretary, Treasurer, Newsletter Editor, Historian. Section 2 of Article VII sets term limits for all officers at two years. Subsequent Sections 3 through 8 describe the duties of each officer.

The bylaws as they will read if the amendment is adopted:

- The first sentence of Section 3 of Article VI will be **updated and clarified** to read, "At each annual meeting the membership shall elect officers and councilors as necessary to fill vacant or expiring positions."
- "g. Website Administrator *8" will be added to the list of officers in Section 1 of Article VII.
- Section 9 will be added to Article VII to describe the new officer position as follows: Section 9. Website Administrator – The Website Administrator will be responsible for designing, adding, maintaining, and updating content on the website of the Geological Society of Maine. Content development will be conducted in coordination with the Executive Council and any committees created by the Executive Council, but final design implementation is at the discretion of the Website Administrator. The Website Administrator will serve as the liaison with the website provider in coordination with the Treasurer.
- The first sentence of Section 1 of Article VIII will be updated to read, "The Executive Council shall be composed of the ***seven*** elected officers plus three additional councilors elected from the membership of the Society."
- Footnote *8 will be added to document if the proposed change is approved: "Proposed and accepted at the Fall Meeting of November 8, 2019 (see meeting minutes in the Spring 2020 GSM Newsletter)."

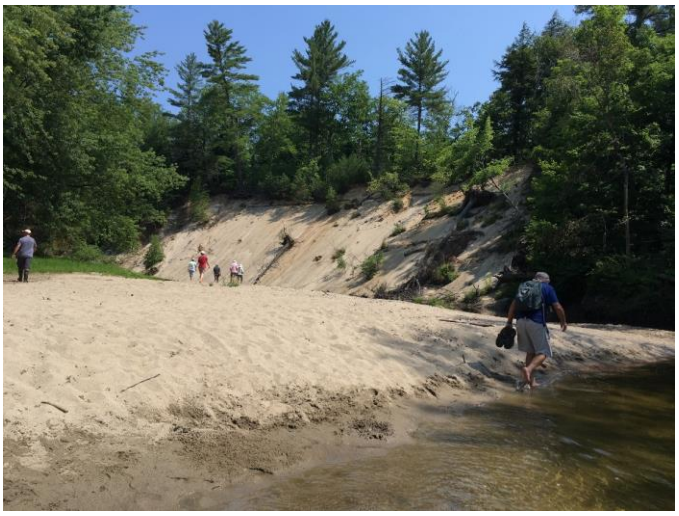
In addition, if the motion is passed by a vote of the present membership, there will be a separate vote to fill the new officer position. We will nominate Cassaundra Rose, as she is already serving in this role.

2019 SUMMER FIELD TRIP REVIEW

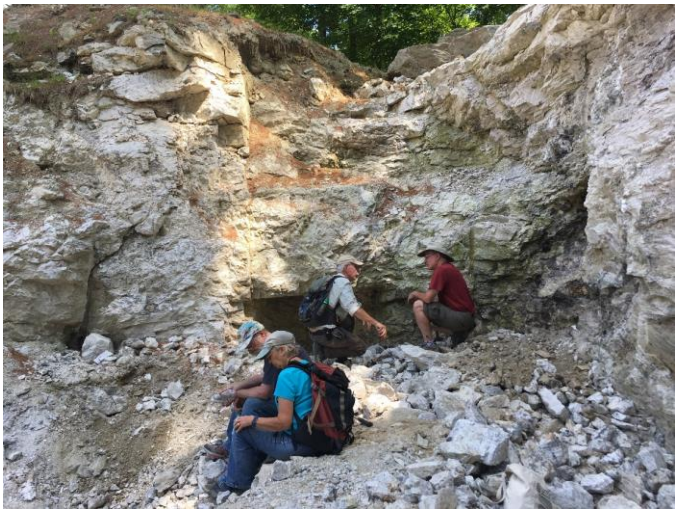
Pegmatites and the Ellis River Valley: A Visit to Western Maine July 27-28, 2019

The summer field trip to western Maine was a great success! With over 50 participants including at least 7 middle school and high school educators, the group visited multiple world class pegmatite quarries and observed some excellent views of an esker and other surficial geologic features. Especially refreshing was the walk through a portion of the Ellis

River where a steep cut bank exposes a wall of sand and gravel outwash. The Bumpus Quarry tunnel provided an opportunity to view graphic granite in three dimensions! The group enjoyed a cook-out dinner (thank you, Marty) and tour at the Maine Mineral and Gem Museum (thank you, staff). Participants had the opportunity to build their own rock and mineral collection and talk to the experts about their finds! Overall, an excellent two days. Thank you, Myles Felch (organizer) and all the field trip guides (Lindsay Spigel, Amber Whittaker, Ryan Gordon, Al Falster, Jim Nizamoff, Chris Koteas).



Crossing the West Branch of the Ellis River.



Bumpus Quarry.

Sarah Hall & Myles Felch

2020 SPRING MEETING ANNOUNCEMENT

Early April 2020
University of Maine at Farmington

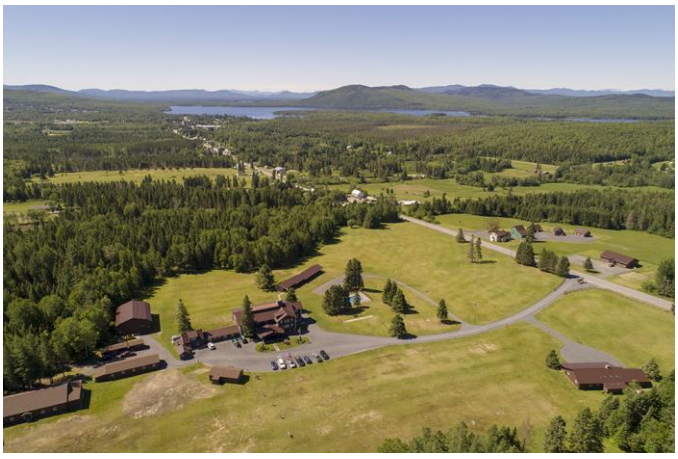
The 2020 GSM Spring Meeting will be held at the University of Maine at Farmington in early April. Abstract submissions will be solicited in late February. We are excited to see what Maine's geology students have been up to in the past year!

Doug Reusch
reusch@maine.edu
Dave Gibson
dgibson@maine.edu

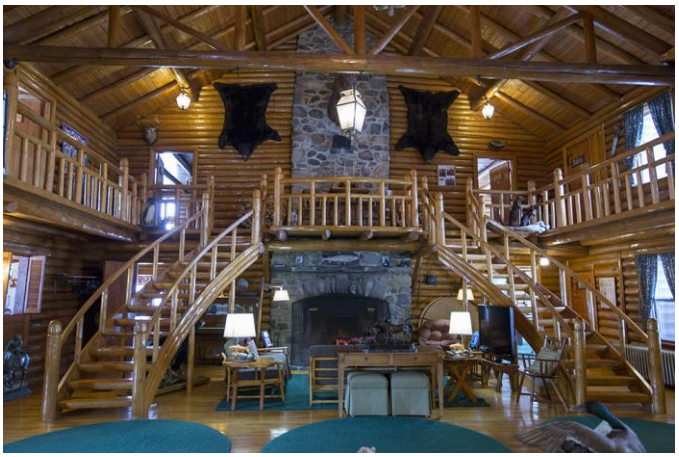
2020 SUMMER FIELD TRIP ANNOUNCEMENT

July 31 – August 2, 2020
Northern Maine

The 2020 GSM Summer Field Trip is being planned for northern Maine on 7/31-8/2. Basecamp will be at Sky Lodge, Unity College's northern outpost, and the weekend will include bedrock and surficial geologic topics. The two pics are courtesy of Unity College. Stay tuned for more information as planning progresses.



An aerial view of Sky Lodge.



Inside of Sky Lodge.

Kevin Spigel, GSM Vice President
kspigel@unity.edu

WEBSITE UPGRADE

Slowly but surely!

We've run up against some key functionality and design issues, but rest assured we are still committed to getting a new GSM website up and running where we can pay dues online! Thank you for your continued patience.

Cassaundra Rose, GSM Website Administrator
Bruce Hunter, GSM Treasurer
Amber Whittaker, GSM Newsletter Editor

NEWS FROM THE STATE GEOLOGIST

Can Maine Contribute to the Nation's Reserves of Critical Minerals?

Critical minerals provide the raw materials for vital components of our modern conveniences – everything from cell phones to solar panels to batteries. Yet, the USA relies heavily on imports for most of these materials, and supply disruptions can have devastating consequences. In response to Presidential Executive Order 13817 which targets national self-reliance in critical mineral supply, in 2017 the U.S. Geological Survey completed the report, "Critical Mineral Resources of the United States— Economic and Environmental Geology and Prospects for Future Supply." Paraphrased from the report's introduction:

> This report reviews 23 mineral commodities viewed as critical to a broad range of existing and emerging technologies, renewable energy, and national security. The commodities included are antimony, barite, beryllium, cobalt, fluorine, gallium, germanium, graphite, hafnium, indium, lithium, manganese, niobium, platinum-group elements, rare-earth elements, rhenium, selenium, tantalum, tellurium, tin, titanium, vanadium, and zirconium. These commodities have been listed as critical and/or strategic based on likelihood of supply interruption and the possible cost of such a disruption. For some of the minerals, current production is limited to only one or a few countries. For many, the United States currently has no mine production or any significant **identified** resources [*emphasis added*].

The Executive Order further directs the federal agencies to develop "a plan to improve the topographic, geologic, and geophysical mapping of the United States….to support private sector mineral exploration of critical minerals," that will ultimately lead to the **identification** of new significant resources in the USA.

As part of this effort, the USGS has initiated a cooperative program with state geological surveys to gather available information about these critical minerals and, more importantly, to identify prospective areas in the States where exploration might be most fruitful. The Maine Geological Survey received a grant through this program by which we are addressing beryllium, cesium, lithium, cobalt, manganese, and tin – the first three commodities are important components of pegmatites and the latter associated with sulfide ores or slates. Choosing lithium as an example, worldwide reserves occur in only two geologic settings: salt brines and pegmatites. Imports to the USA come from the world's largest reserves in salt brines of South America and pegmatites of Australia. Yet, thanks to spodumene discoveries in western

Maine, we know that there is significant potential in Maine's pegmatites for world-class lithium resources.

It is our great fortune to have an experienced team working on this project, including Fred Beck (FM Beck, Inc.), Dwight Bradley (USGS, emeritus), Myles Felch (Maine Mineral and Gem Museum), Amber Whittaker (MGS Senior Geologist), and Chris Halsted (MGS Director of Earth Resource Information). Fred brings decades of Maine exploration knowledge to the process, Dwight is a co-author of the USGS report, Myles has extensive experience in pegmatites, and Amber and Chris bring GIS and data management expertise. In October, Amber, Fred, and Myles will attend a Critical Minerals Workshop hosted by the USGS in Reston, VA, to further network with other eastern geologists working in the program. By the end of the year we expect to have a series of potential resource maps that I think, in terms of addressing critical mineral needs, will shine a lithium-powered spotlight on Maine.

Robert G. Marvinney, State Geologist
robert.g.marvinney@maine.gov

OBITUARIES

The geologic community has lost several members in the past year.

Peter Robinson passed on March 25. Read a tribute from his colleagues on the UMass Amherst Geosciences website.

Donald William Newberg passed on June 17. See his obituary in the Portland Press Herald.

Sheila Seaman passed on July 27. Read her memorial on the UMass Amherst Geosciences website.

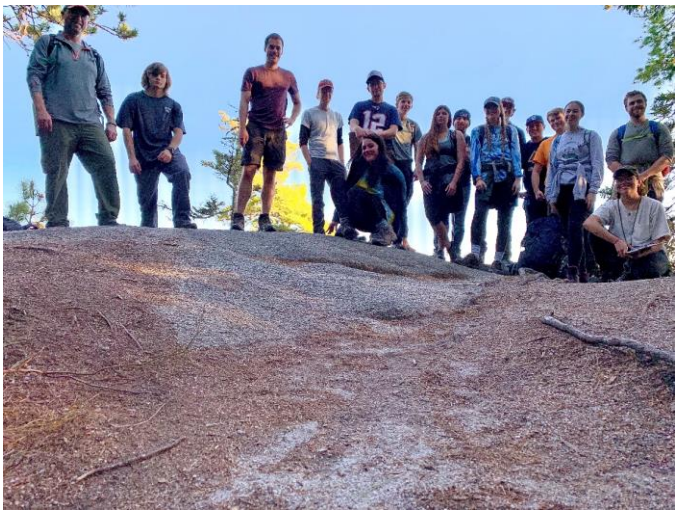
T. Boone Pickens, legendary philanthropist and geologist, passed on September 11. Several remembrances are on the Oklahoma State University website, including at the Boone Pickens School of Geology site.

NEWS FROM THE CAMPUSES

University of Maine at Farmington

Spotted in the recent issue of In the Trenches, the news magazine of the National Association of Geoscience Teachers: David Gibson was awarded the Geo-CUR Award, given in recognition of outstanding undergraduate research mentoring. Way to go, Dave! geocur.org

Unity College



Unity College students near the Ice Caves in the Debsconeag Lakes Wilderness. Photo Credit: Raegan Goulet.

Life in the Geoscience program at Unity is moving by at a rapid pace. Students are now in the midst of various research projects on stream hydrology, groundwater modeling, climate modeling and more. I overhauled one of the junior/senior level courses, Geomorphology, by adding five additional field trips which means we are on the road 12/15 weeks! So far, so good, as we make our way through the state with the usual stops in Baxter and Acadia, but also to areas in central, western, and southern Maine. By far most of our trips are related to glacial systems, but we will cover fluvial and soil systems as well as some bedrock geology. Our drone project on water quality is still ongoing and was actually

featured in a short segment on 207, though flights will conclude at the end of the month. Image processing and data analysis will continue as we prepare to present at the North American Lake Management Society meeting in Burlington, VT in November.

Kevin Spigel
kspigel@unity.edu

University of Maine at Presque Isle

Kevin McCartney has returned from a six-month Kósciuszko Fellowship in Szczecin, Poland. The main thrust of this most recent sabbatical continues research from the Fulbright of two years ago. Kevin's research interest is the silicoflagellates, a marine algal group with siliceous skeletons and geologic range of Early Cretaceous to Recent. About ten years ago, Kevin published a paper on the Cretaceous evolution of the group and much of his subsequent work has been on the more complicated topic of Cenozoic evolution. He has a paper on the evolution of one silicoflagellate group in review, with submittal of the more general "Silicoflagellate Evolution Through the Cenozoic" waiting until the first paper is accepted for publication. He also has papers with students and colleagues from several countries in preparation.

Kevin McCartney
kevin.mccartney@maine.edu

ITEM OF INTEREST

A Field Guide to the Geology of Northern New England

Mike Dorais at Brigham Young University writes, "I've written a field guide to the geology of northern New England that might be of interest to members of the Geological Society of Maine. It was written for the undergraduate geology major. It's online and can be downloaded free for anyone who wants it." It can be found online at:

http://www.geology.byu.edu/Home/content/publications

Thanks, Mike!

SECRETARY'S REPORT

GSM held no formal business meeting since the latest Secretary's Report, provided in June 2019. There are no minutes to report at this time.

The Executive Council met on September 3, 2019, by conference call. The agenda included a debrief from the summer 2019 field trip, planning for GSM's fall meeting, an update on the GSM website upgrade, updates from the Walter Anderson Fund Committee, and initial planning for the summer 2020 field trip.

Respectfully submitted,

Lisa Jacob, GSM Secretary
ljj@smemaine.com

TREASURER'S REPORT

Change in Anderson Fund Accounting

In the fall of 2019 GSM started planning for the Walter Anderson Educational Fund Campaign. Changes were made accordingly to the accounting done for the Anderson Fund which will be reflected in the Treasurer's report. One of the first steps was to open an endowment account at Bath Savings Trust. A majority of the funds were moved from the Anderson Fund Account in the Maine State Credit Union to the Bath Savings Trust on October 20, 2018. More funds, some of which were held in Certificates of Deposit (CDs) have been moved since, emptying the account. Henceforth this account will be used for the new Kevin McCartney Fund. This does not affect the General Fund Account: GSM has two accounts at the Maine State Credit Union.

When we take payments by credit cards on the new website our payment processor requires that the money be deposited in one account only. All

deposits will go into the General Fund account. I will transfer future Anderson Fund donations to the Bath Savings Trust from that account. As a result, the Treasurer's Report will look different. It will show income going into the Anderson Fund which will then be denoted as an expense when it is transferred to Bath Savings Trust.

Fiscal Year August 1, 2018 to July 31, 2019

	Actual
Income	
Dues Paid	$6,555.00
Donations to Anderson Fund	$3,789.00
Field Trip 2018 registration payment	$10.00
Field Trip 2019 registration payments	$770.00
Subtotal	**$11,124.00**
Expenses	
Dues Letter mailing	$174.92
Penalty for Early Withdrawal of 2 Anderson Fund CDs	$23.27
Postage	$10.40
Meeting Expenses	
Fall Meeting 2018	$1,506.00
Fall Meeting 2019 (down payment)	$175.00
Name tags and pens	$16.56
NE GSA booth	$325.00
NE GSA Sponsorship	$100.00
Spring Meeting	
Student presentation awards	$200.00
Engraving names on Plaques	$17.94
Summer Field Trip	
Field Guide Publication	$247.50
Campground Fees	$401.12
Cookout food	$407.60
Anderson Fund	
Field trip award to UMaine Farmington Geology Club	$750.00
Transfer Anderson Fund money to Bath Savings Trust	$3,039.00
GSM Website	
Domain renewal	$28.95
Annual hosting plan cost	$245.00
New web site programming	$2,600.00
Online payment processing costs	$275.43
Subtotal	**$10,543.69**
Net Increase	**$580.31**

Annual Asset Summary July 31, 2019

Account	Sub-Account	July 31, 2019
General Fund	**Maine State Credit Union**	
	Business Savings	$26.84
	Checking	5,287.83
	Sub-Total	**$5,314.67**
Anderson Fund	**Bath Savings Trust**	
	Managed Account	$26,491.82
	Sub-Total	**$26,491.82**
Kevin McCartney Fund	**Maine State Credit Union**	
	Business Savings	$5.26
	16 Month CD 2.75%	$10,280.50
	Sub-Total	**$10,285.26**
Total Assets	**All Funds**	**$42,091.75**

UPCOMING EVENTS

Date	Event	Location	Organizer
October 13-19	Earth Science Week	Check the website for events	American Geosciences Institute www.earthsciweek.org
October 27-29	Exploration Mining and Petroleum Conference	Fredericton, New Brunswick, Canada	New Brunswick Department of Energy and Resource Development
November 8	**2019 GSM Fall Meeting**	**Augusta Civic Center**	
December 9-13	2019 American Geophysical Union Fall Meeting	San Francisco, California	www.agu.org
2020			
March 1	**Anderson Fund grant proposal deadline**		**GSM**
March 1-4	Prospectors & Developers Association of Canada (PDAC) Annual Convention	Toronto, Ontario, Canada	Prospectors & Developers Association of Canada www.pdac.ca
March 16-20	51st Lunar and Planetary Science Conference	The Woodlands, Texas	Lunar and Planetary Institute & NASA Johnson Space Center
March 18-22	6th Maine Science Festival	Bangor	www.mainesciencefestival.org
March 28	2020 Maine Sustainability & Water Conference	Augusta Civic Center	Senator George J. Mitchell Center for Sustainability Solutions
Early April	**2020 GSM Spring Meeting**	University of Maine at Farmington	Doug Reusch & Dave Gibson
May 11-13	GeoConventions GAC-MAC	Calgary, Alberta, Canada	

Please submit events to include on the calendar to the Newsletter Editor: amber.h.whittaker@maine.gov

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 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 membership:

2020 FEE SCHEDULE

$ 30.00	REGULAR MEMBER	Graduate geologists, or equivalent, with one year of practice in geology, or with an advanced degree.
$ 30.00	INSTITUTIONAL MEMBER	Libraries, societies, agencies, businesses with interests in or practicing geology and related disciplines.
$ 15.00	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	$ 30.00	$_____	Name _____	**Make checks payable to:**
Institutional Members	$ 30.00	$_____		Geological Society of Maine
Associate Member	$ 15.00	$_____	Address _____	Bruce Hunter, GSM Treasurer
Student Member	$ 5.00	$_____		44 Old Fairgrounds Rd
Contributions to GSM		$_____	_____	Readfield, ME 04355
(please write gift or fund on check)				
TOTAL ENCLOSED		$_____	_____	

Email Address _____

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

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

Amber Whittaker, Newsletter Editor
amber.h.whittaker@maine.gov
207-287-2803

2019/2020 SOCIETY YEAR BEGAN August 1
PLEASE SEND DUES TO TREASURER.

THE GEOLOGICAL SOCIETY OF MAINE
c/o Bruce Hunter, GSM Treasurer
44 Old Fairgrounds Rd
Readfield, ME 04355

PLEASE PAY YOUR DUES!

THE GEOLOGICAL SOCIETY OF MAINE EXECUTIVE COUNCIL

President	Sarah Hall	(2020)	College of the Atlantic, shall@coa.edu
Vice President	Kevin Spigel	(2020)	Unity College, kspigel@unity.edu
Secretary	Lisa Jacob	(2020)	Sevee & Maher Engineers Inc., ljj@smemaine.com
Treasurer	Bruce Hunter	(2020)	Maine DEP, bruce.e.hunter@gmail.com
Newsletter Editor	Amber Whittaker	(2020)	Maine Geological Survey, amber.h.whittaker@maine.gov
Directors	Martin Yates	(2019)	University of Maine, yates@maine.edu
	Mike Deyling	(2020)	CES, Inc., mdeyling@ces-maine.com
	Henry Berry	(2021)	Maine Geological Survey, henry.n.berry@maine.gov
Historian	Daniel Belknap	(2020)	University of Maine (retired), belknap@maine.edu