THE MAINE GEOLOGIST

THE NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MAINE

FEBRUARY
1991
V. 17
NO. 1

President's Message
by
Carolyn A. Lepage

Education, whether at the elementary/secondary school or professional continuing education level, is on everyone's mind these days. We hear much about the dismal state of science education in our public schools these days. The Society's winter meeting, hosted by Art Hussey at Bowdoin College, focused on how geologists and earth science teachers could work together to update and improve the geological information presented in earth science classes at the elementary, junior high school and high school levels. While the attendance at the meeting was relatively light, the presentations and discussions were lively and thought-provoking. Notes from the meeting are included elsewhere in this newsletter. Earth science teachers need our help to keep up with the latest geological and environmental issues and developments. I hope you will take the time to volunteer your services, whether through a formal program like the Geological Society of America's Partners in Excellence Program or to your local earth science teacher. Speaking from experience (I have spoken to several of Pat Millette's Farmington Junior High classes as well as at a National Association of Geology Teachers meeting), the process is positive and rewarding. I'd like to thank Art Hussey and his advisory committee again for getting the ball rolling. We all need to participate to keep the momentum.

We will hear from the next tier of students at our spring meeting at Bates College on April 5th. Dyke Eusden is soliciting abstracts from students at the various campuses throughout Maine. Our evening speaker will be John Williams, Executive Director of the Maine Low-Level Radioactive Waste Authority. John's topic will be **"Geopolitical Aspects of Low-Level Radioactive Waste Disposal in Maine"**.

On the professional level, Bob Doyle has found a number of geologists willing to develop study guides/bibliographies/course outlines and present short courses on selected topics of interest to the practicing professional geologist. He is now in the process of assembling a questionnaire to determine the level and specific areas of interest within the geologic community for the study materials and/or classes. When the questionnaire appears in your mailbox, please take time to complete it and return it to Bob.

The DEP Task Force is making progress in its efforts to encourage and develop low-cost (or no-cost) educational opportunities for practicing professionals in Maine. The "Fate and Transport of Contaminants" seminar series will be held on five successive Thursday nights beginning April 4th at the USM Continuing Education campus, Cooks Corner, Brunswick. Course announcements will be forthcoming from USM. The one-day modeling workshop will likely be held in the fall. If you have any suggestions for future topics, please give me a call at (207) 865-6138.

Geological Society of Maine
Spring Meeting

Bates College
Lewiston, Maine

April 5, 1991

Detailed announcements concerning the spring meeting agenda will be mailed to all GSM members closer to the meeting date. The afternoon session will consist of student abstract presentations; exact starting time is dependent upon the number of abstracts submitted. The Business Meeting will be held at 5:00 pm, followed by a Social Hour. The cost for the Social Hour is $4.50 per person and attendees are urged to have exact change. Dinner will be available in the dining commons. The evening speaker is scheduled for 7:30 pm. John Williams, Executive Director of the Maine Low-Level Radioactive Waste Authority will speak on "Geopolitical Aspects of Low-Level Radioactive Waste Disposal in Maine".

Call for Abstracts

Geological Society of Maine
Spring Meeting
April 5, 1991
Bates College, Lewiston, Maine

Students in Maine colleges and universities and students from other schools working on projects in Maine are encouraged to present papers in oral or poster form at the Spring Meeting of the Geological Society of Maine. This program gives students working on Maine-related senior theses, independent studies or master's theses an opportunity to discuss their research before a professional audience. Abstracts will be published in the issue of the Maine Geologist following the meeting.

Oral presentations are 20 minutes in length which includes five minutes for questions. Slide and overhead projection facilities will be available. Those presenting in poster format will have available two poster boards with dimensions of 6 feet x 5 feet.

Abstracts must be written in accordance with the GSM format and must not exceed 250 words. All of your text must be fit within a 4-1/2" x 4-1/2" box. A sample abstract is available to serve as a guide in preparation; abstract forms are also available. The original and two copies of the form must be submitted. For abstract forms and/or submissions, contact:

Dr. Dykstra Eusden
Department of Geology
Bates College
Lewiston, ME 04240
(207) 786-6152

Abstracts must be received by February 22, 1991. Late abstracts may be considered.

GSM WINTER MEETING FEBRUARY 2, 1991
MINUTES

The Geological Society of Maine Winter Meeting, held on February 2 at Bowdoin College, focused on Teachers and Geologists in Cooperation. Arthur Hussey, geology professor at Bowdoin, in his opening remarks denoted an "earth science illiteracy" among the general population. It is time that geologists focused some attention on earth science education to aid the general public. That is why GSM, the Geological Society of America (SAGE), and interested Maine geologists and teachers are involved in the "Teachers and Geologists in Cooperation" program.

Patti Millette, Pat Seaward, and students from Mount Blue High School first discussed what happens when geologists, teachers and students get together. Pat Seaward suggested that earth science teachers focus on what is going on outside the classroom in earth science. Patti Millette claimed that many teachers teaching earth science courses lack formal training in the discipline. Interested Maine geologists can get involved in helping these teachers. Mount Blue High School students discussed how they became involved in earth science projects and what they have learned from those experiences.

Woody Thompson of the Maine Geological Survey discussed the CREST Proposal (Curriculum Resources for Earth Science Teachers in Maine). It is a proposal before the National Science Foundation for 3 years and 300,000 dollars. The teacher enhancement program would, if funded, involve teachers and geologists working with interns on earth science lesson plans, field trip guides, source books on New England geology, maps, video programs, and rock and mineral reference collections. Its main goal would be to increase communication between those involved in earth science education through newsletters, meetings, etc.

Arthur Hussey introduced the group to SAGE, the Geological Society of America's focus on "Scientific Awareness through Geoscience Education." The GSA in its Partners for Excellence Program will provide aid and materials to those geologists who want to help educators teach earth science. A variety of aids will be made available: videos, brochures and seminars.

Efforts of individual Maine geologists to involve teachers in geological activities was next discussed. Fred Beck, of F. M. Beck/Northeast Geophysical Lab, has worked with grade school students by providing school classes with tours of his lab. Mark Censi, of Sweet Associates, offers his services as a consulting geologist in Maine to lead adult level field trips through continuing education programs. Consultants expertise can be passed on to interested teachers. Steve Pinette and Marianne Dubois of the Maine DEP explained the materials and services that they provide for teachers. The DEP staff talks to school classes, answers technical questions and provides educational materials. Lesson plans on groundwater will be considered in the future.

Woody Thompson talked about the materials and services available from the Maine Geological Survey. Teachers were urged to contact and visit the MGS office for information on maps, geology, air photos, groundwater, publications, etc. Popular publications, and a resource center and slide collection are available.

Lucky Greenleaf, Maine's 1984 Teacher of the Year, was the evening speaker and his talk was entitled, "Earth Science Education in Maine: Ways to Make an Impact". He presently teaches earth science at Belfast High School and has been teaching earth science since 1965. He also teaches marine geology courses in the summer to college age students. His thought was that the elementary grades don't teach enough science. He would like to see more emphasis on the applications of science, not the memorization of facts. The impacts and issues of science need to be better discussed. Educators need to know where to go for better information and networks of specialists in different fields need to be assembled. The common goal is to educate citizens in the sciences.

GSM Treasurer's Report
Period Ending 1/31/91

Balance on hand 7/27/90		$3,887.83
Receipts		
Dues & Application Fees	$697.76	
Publication Sales	$218.00	
Field Trip Fees	$229.00	
		$1,144.76
Disbursements		
Postage	$272.03	
Printing	$410.75	
Meals (Orono)	$421.99	
		($1104.77)
Balance on hand 1/31/91		$3927.82

s/Michael E. Foley, Treasurer

DEP Task Force Update
by
Carolyn A. Lepage

The DEP Task Force has continued to meet on an almost monthly basis. Discussions have centered on three areas: low-cost/no-cost educational opportunities, career paths, and project management. As I mentioned in the President's Message, the Fate and Transport Symposium will be held in April and May at the USM Continuing Education campus in Brunswick. The cost will be about $100.00. We anticipate that the modeling workshop will be scheduled for the fall. With these two ventures well under way, the Task Force will turn its attention to other training needs. Suggestions for future topics are welcome.

The focus of the career path discussions has been on enhancing job satisfaction and staff retention and continuity. Any action the Task Force might suggest must fit within the bounds of the union contract and take into account budgetary and legislative realities. Recognizing staff efforts and accomplishments and providing educational opportunities are two of the tactics suggested. DEP staff have expressed interest in broadening project management skills. In addition, professionals from both the private and public sectors hope to develop a better understanding of the various project tracking and prioritizing systems already in place within the DEP. The common goal might be to make these systems more efficient and responsive. The Task Force will be presenting its suggestions for enhancing career paths and project management to the DEP Senior Management Team (Commissioner, Deputy Commissioner, and Bureau Directors) in April.

Vermont Geology: Volume 6
The Quebec-Vermont
Appalachian Workshop

Edited by
Maurice Colpron and Barry Doolan

The collection of expanded abstracts that accompanied the Quebec-Vermont Appalachian Workshop in April 1989 has been reissued as Vermont Geology: Volume 6. Unlike many abstract volumes, the 26 short papers and accompanying figures presented here are sufficiently detailed to serve as valuable references for those interested in the Quebec-Vermont section of the Appalachians. The volume is organized into five sections. The first two sections focus on the rift history and depositional setting of the northern Appalachian orogen prior to the Taconic orogeny. Section I is Evolution of the Ancient North American Margin in the Quebec Reentrant. Section II is Terranes outboard of the ancient North American Margin. The third and fourth sections address the style and sequence of deformation associated with formation of the orogen. Section III is Destruction of a passive margin I: Evolution of the Quebec/Northern Vermont Orogen. Section IV is Destruction of a passive margin II: New developments in the Vermont Appalachians. The fifth section presents results and discusses problems encountered using geochemical and geochronological techniques to study the orogen. Section V is entitled Geochemistry and Geochronology in the Vermont-Quebec orogen.

The price for this volume is $12.50 (U.S. funds) and may be ordered from:

Vermont Geological Society
P.O. Box 304
Montpelier, VT 05602

Geochemistry Lecture
by Michael Barcelona

Planned for Spring 1991

A group of hydrogeologists, working in cooperation with University of Southern Maine, are in the process of trying to organize affordable short-courses on hydrogeologic topics of interest to students, consultants and regulatory officials in Maine. Plans are underway to bring Michael Barcelona, an Environmental Chemist, to Maine to discuss various topics relating to organic and inorganic groundwater geochemistry. Mike is on the faculty at Western Michigan University in Kalamazoo, Michigan and was formerly with the Illinois Water Survey. The group hopes to schedule the one-day seminar sometime in May or June and to keep the cost under $100 per person. Announcements of the exact date, location and topics to be discussed will be mailed as soon as the program is finalized.

Thomas Weddle successfully defended his Ph. D. defense December 3, 1990 at the Boston University Department of Geology, Boston, Massachusetts, and his abstract is printed below. Any abstracts of masters and doctoral theses on Maine geology can be published in the newsletter and we hope that others will take advantage of this.

STRATIGRAPHY OF LATE WISCONSINAN DEPOSITS IN THE LOWER SANDY RIVER VALLEY, NEW SHARON AND MERCER, MAINE, AND RELATIONS WITH TILL STRATIGRAPHY IN ADJACENT AREAS

Thomas K. Weddle
Maine Geological Survey
State House Station 22
Augusta, Maine 04333

Quaternary glacigenic deposits exposed along the Sandy River valley in New Sharon and Mercer, Maine, are associated with ice-proximal deposition in a northeast-trending stream valley. Fine-grained sediments represent distal deposits by turbidite deposition, turbid sediment plumes, and associated ice-rafted debris in a proglacial lake. Coarse-grained deposits and stratified diamicton are ice-proximal sediments deposited by gravity flow processes, subaqueous sediment discharge, and fluvial deposition. Massive diamicton was deposited by subaqueous sediment discharge or by basal ice processes.

Kinetostratigraphic relations indicate an upsection shift in deformation from a northeast to a northwest source. The shift is attributed to Late Wisconsinan sublobes in the Sandy River and Kennebec River valleys. Ice in the Kennebec River valley dammed drainage in the NE-oriented lower Sandy River valley creating a proglacial lake into which both sublobes deposited and deformed proglacial sediments during the early Late Wisconsinan. Main phase Laurentide ice eventually merged with and overwhelmed the sublobes.

An organic-bearing locality, the site of the New Sharon beds was re-excavated. Previously this site was described as a two-till locality with an interglacial paleosol, correlated with the till stratigraphy of southern New England. Analyses of the New Sharon beds and other units infer this correlation is not warrented. There is no pre-Late Wisconsinan weathering profile on any of the New Sharon deposits. Clay-mineral alteration in the units at New Sharon reflect postglacial weathering like that in Late Wisconsinan tills in southern New England and southeastern Quebec.

Multiple tills and diamictons present at New Sharon are basally deposited till or glacigenic flow deposits formed in a proglacial environment; complex diamicton facies rather than multiple glacial events separated by interglacial periods best explains their origin. In association with sedimentologic and stratigraphic relations, the lack of paleosols and absence of extensive stratified drift interbedded with the diamictons infers that the glacigenic sediments were deposited entirely during a single glacial cycle, the Late Wisconsinan.

Suggestions for Guest Speakers
by
Patti Millette

In light of the discussion that went on during the recent GSM meeting at Bowdoin College on teachers and geologists in cooperation, I have put together a list of questions that the field professional might want to ask before entering the educational realm at any level as a visitor. Please send a list back to me if you have suggestions other than these. If not, then the ones here contain the kind of information I try to supply when I have guest speakers. I hope they will be helpful.

1) How many classes are you expected to talk to?

2) What kind of background do the students have?

3) What kind of vocabulary do the students have within the topic?

4) How many students are in each class?

5) Are they different levels or heterogeneously mixed? (Grades past 8th will tend to be tracked, grades earlier will tend to be heterogeneously mixed. Often it can be beneficial to change your approach slightly according to the group. The more information you have on the students, the easier it is to adapt the presentation. "Know thy audience!")

6) Are you expected to bring any equipment? (i.e. rocks, maps, geiger counter, gas masks, protective clothing, weather sensing devices, etc...)

7) Is there audiovisual equipment available?

8) Are there computers available for use? What kind(s)?

9) Is there water available in the room?

10) Will you need an extension cord?

11) How long is each class?

12) Do you need to bring lunch with you? Are you willing to eat school lunch?

Things to remember:

1) Never overestimate the knowledge of your audience, but don't underestimate their intelligence either. Kids will turn you off immediately if they feel you are being condescending.

2) You are the link between the academic world and the real world. In some cases you could be the only thing that makes science more than a textbook exercise.

3) Students will almost always believe everything you say. You are a "real" person. (As opposed to their teacher who is not necessarily a "real" person.)

4) With upper grades that have students thinking about potential careers, put in a plug, a realistic plug, for your profession. Stress the need for students to excel in all related studies. Schools these days are trying to move towards more interdisciplinary studies, and it's good for students to hear from you that they need to be proficient in skills such as language and math as well as science. They hear it from us all the time, but I'm sure they truly do not believe it.

5) Pin the teacher down to a narrow topic. Frequently they will ask for a broader topic than you can possibly cover in one class period.

6) Students, especially at the secondary level, respond much more successfully to a presentation that is exciting, so if you are visibly enthusiastic, you will likely get a better response. Very often, the most difficult part of teaching is to get students to believe they want to learn about your topic.

7) Try and relate the presentation to them. Students are egocentric, and if it doesn't relate to their life, they often aren't interested.

8) Students, even at the upper levels are fascinated with equipment. Any time you bring "stuff" with you that they can see or touch (touch preferably), the presentation will be much more successful. It immediately gets them involved.

9) Don't be afraid to gently call on a student who's getting out of line. It's not really your job and most often the teacher will take care of it, but if YOU do it, and do it diplomatically, you are almost assured that no one else will get out of line. Don't put up with anything you wouldn't take from your own kids. If you need to, stop and wait. They'll get the idea fast.

10) If you ask a question of the class, give the students some time to think up an answer. Most of the time they will be shy in front of you, and if necessary, repeat the question. After the second time, they will get the idea that you really DO want an answer and often will oblige.

11) Analogies work wonders. They can be a link between what students already know and the new things you want them to understand. (My students' favorite analogies are food analogies. For example, a metamorphic rock is analogous to a Snickers candy bar left out on a hot pavement with a brick on top of it.)

12) Most of these students will not be graduate students who are there because they've paid and want to be there more than anything else. Quite often, many of them would just as soon be elsewhere. So if you can engage them with the most exciting, most interesting, most dramatic thing you can come up with at the beginning, you'll have them hooked for the rest of class.

Notes from the Certification Board
by
Andy Tolman

The Board continues its work on the new exam. We have administered one version, and have had one re-exam. The success rate on the new exam is much lower than on the old one. We suspect that the old exam was not quite as confidential as we might have wished, after nearly ten years of use.

We continue to receive applications at a rate of 10 to 15 per meeting, or about 50 a year. This level of activity would have been unheard of three or four years ago. Despite (or maybe because of) this activity, the Board is having financial problems. Our contribution to the general state coffers was increased significantly to help reduce the current deficit, and that leaves us with little to spare. You will be hearing about solutions to these difficulties soon.

I hope all of the Certified community has ordered their new, better-looking certificates. We have had a number of complaints about the old ones, and expect the new ones to be well-received.

Tom Weddle, who has a cousin on the California Geologist Board, has been doing some research. It appears that California will consider reciprocity for Maine Certified Geologists. We offer partial reciprocity to California Geologists and others certified by examination. They need to take the Maine-specific parts of our exam, but not the general or specialty sections.

LIGO May Come to Maine
by
Robert G. Marvinney, MGS

Blueberries often come to mind when we think of the broad flat expanses of interior Washington County since the region is well known statewide for its production. Within a few years the region may become well known worldwide for something extraordinarily different -- the detection of gravity waves. The Maine Science and Technology Commission in cooperation with the Maine Geological Survey and the University of Maine is proposing a site in the blueberry barrens of Columbia Township for a Laser Interferometer Gravity-wave Observatory (LIGO). The LIGO project has been developed by Caltech and MIT and has received initial funding from NSF. There will be two LIGO sites in the country -- one on the west coast (probably Edwards Air Force Base) and one somewhere in the east. Currently, several sites in the east and south are developing competing proposals for the eastern site. The Maine site is proposed for the glacial-marine delta complex of Pineo Ridge.

A LIGO facility will consist of two buried vacuum tunnels each 2.5 miles long and set at 90 degrees to one another in an L shape. A powerful, precisely controlled laser beam is generated at the vertex of the tunnels, is split and projected down each tunnel. High-precision mirrors at the end of each tunnel reflect the beams back to their source where their wave patterns are compared. Under normal conditions the two beams will match exactly. If a gravity wave, produced by the collapse of a black hole or some other exotic cosmic phenomena, passes through the observatory one arm will be relatively stretched and the other shortened. This distortion will manifest itself as interference patterns when the relected laser beams are compared. According to Einstein's Theory of Relativity, gravity waves distort time and space but the distortions are extremely minute, on the order of 10^{-20} miles. The greater the length of the laser tunnel, the greater the possibility of detecting a gravity wave.

Two widely spaced sites are needed to ensure that the distortions are not seismic in origin. Man-made noise (vehicular traffic, blasting) may also be a problem. The Columbia site may be ideally placed in that it is relatively seismically quiet (especially when compared with Edwards AFB!), isolated from most man-made interference, and about as far as one can be from California and still be in the U.S. Other potential eastern sites do not enjoy these characteristics. Eventually a European site and an Australian site will be added to the program to enhance detection. The detection of gravity waves, astrophysicists predict, will open new windows on the origin of the universe in much the way radio and X-ray observatories did several decades ago.

Our proposal is due to Caltech by March 1, 1991 with site selection occurring in September. If the Columbia site is selected, the excavation of the 2.5 mile-long tunnels will present an unprecedented opportunity to the Maine geological community -- an in-depth analysis of the premier glacial-marine delta complex. We'll plan some field trips when construction begins.

A Technical Seminar Presented By
Maine Section American Society of Civil Engineers

HAZARDOUS WASTE IN CIVIL ENGINEERING
What If You Find Hazardous Waste on Your Site?

March 15, 1991
Ramada Inn, Lewiston, Maine

The seminar objective is to inform civil engineers, contractors, and other professionals in the technical, legal, safety and ethical issues that are involved when hazardous wastes are encountered or suspected in a project. The actual or suspected presence of hazardous wastes affect all members of the design, construction and ownership team. They must be prepared to deal with them. This seminar should impart a working knowledge of how hazardous wastes can impact our projects and to prepare participants to effectively deal with their possible presence. The program will be moderated by Albert Curran, CEO of Woodward and Curran, Portland.

8:15 Registration
8:45 Welcome and Introduction: Steve Bradstreet, President Elect, Maine ASCE, TY Lin, Falmouth
9:00 What is Hazardous Waste? DEP Reporting Requirements: Mike Hudson, Environmental Specialist; DEP, Augusta
9:45 Reporting Requirements - Ethics and Confidentiality: Matthew D. Manahan, Attorney; Pierce, Atwood, Scribner, Allen, Smith & Lancaster; Portland
10:45 Health and Safety: Deborah Roy, Senior Consultant; SafeTech Consultants, Falmouth
11:15 Contractural Issues - Limitation of Liability: Roy Thompson, Attorney; Thompson & Bowie, Portland
12:00 Lunch
12:45 Contractural Issues - Insurance: Alan Quinlan, Director of Mass Marketing; Morse, Payson & Noyes, Portland
1:30 Environmental Site Assessments: Deborah Gevalt, Senior Associate and Vice President; Haley and Aldrich, Cambridge, MA
2:30 Case Histories: Panel Members
3:30 Questions and Answers: Panel Members

The fee for the seminar is $75.00 including lunch and seminar handouts. Checks should be made payable to the Maine Section ASCE. Registration deadline is 5:00 pm, Friday, March 8, 1991. Persons interested in registering should contact:

Dana N. Humphrey
Department of Civil Engineering
103 Boardman Hall
University of Maine
Orono, ME 04469
(207) 581-2176

MAINE MINERAL SYMPOSIUM
APRIL 20 - 21, 1991

The second annual Maine Mineral Symposium will be held the weekend of April 20 - 21, 1991. It is sponsored this year by the Federation of Maine Mineral Clubs with assistance from the Maine Geological Survey. The indoor program will be on Saturday, April 20 at Jewett Hall, University of Maine at Augusta. There will be speakers and exhibits followed by an evening sale of mineral specimens by dealers at the nearby Comfort Inn. A field trip to one of the Oxford County pegmatites is planned for Sunday. The registration fee for the UMA program is expected to be $8.00. Contact Woody Thompson at MGS (289-2801) for details.

Fate and Transport Seminar Series
April - May 1991

A five week fate and transport seminar series sponsored by the Department of Continuing Education at the University of Southern Maine is scheduled for Thursday evenings in April and May 1991. The 2-1/2 hour sessions will move progressively from topics relating to the mechanics of the fate and transport of contaminants in the subsurface up to discussions covering both analytical and numerical contaminant transport models. This course is designed for individuals who have an understanding of basic groundwater principles. Registration is open to everyone and the cost for all five sessions is expected to be approximately $100.00. Announcements and registration forms will be mailed shortly by the University of Maine. If you have questions regarding registration or course content you may contact Carol White at (207) 846-5599 or Bruce Hunter at (207) 289-2651.

Tentative Outline
Fate and Transport Seminar Series
April-May 1991
USM Department of Continuing Education
Cooks Corner Campus
Brunswick, Maine

Session 1: **Dynamics of Unsaturated and Saturated Flow**
Thursday, April 4, 6:30 to 9:00 p.m.
John Tewhey, John Sevee & Charlie Hebson

Mathematical basis of:

- Saturated Flow
- Unsaturated Flow
- Contaminant Transport
- Multiphase Flow

Session 2: **Factors Affecting Fate and Transport in Subsurface**
Thursday, April 11, 6:30 to 9 p.m.
Ron Lewis & Carol White

- Solubility
- Volatilization
- Sorption
- Hydrolysis
- Complexation
- Oxidation/Reduction

- Microbial and chemical transformations
- Co-solvent affects
- Facilitated transport

Session 3: **Site characterization and Conceptualization**
Thursday, April 18, 6:30 to 9:00 p.m.
John Sevee & Carol White

- Determination of physical properties (porosity, foc, etc.)
- Significance of geologic heterogeneities & scale effects
- Determination of retardation coefficients
- Determination of dispersivity values
- Contaminant behavior in fractured systems

Case Histories

Session 4: **Contaminant Transport Modeling**
Thursday, April 25, 6:30 to 9 p.m.
Ron Lewis & Charlie Hebson

Basic types of transport models

- analytical models
- numerical models

Analytical Models

- HELP
- AT123D
- VHS (SOCEM)
- OLM

Session 5: **Contaminant Transport Modeling (cont.)**
Thursday, May 2, 6:30 to 9:00 p.m.
Charlie Hebson & John Sevee

Particle Tracking Models

- MODFLOW/MODPATH
- GW-PATH
- EPA-WHPA

Numerical Models

- MOC/BIOPLUME
- PLASM/RANDOMWALK/INTERTRANS
- PTC
- HST3D

Future Developments in Transport Modeling

- Geochemical speciation/transport codes

MEMBERSHIP DUES STATEMENT

The GEOLOGICAL SOCIETY OF MAINE, INC. 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 dialogue 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 four times a year (more or less), approximately on a quarterly basis starting in September. The Society year runs from August 1st to July 31st. Annual dues and gift contributions to the Society are tax deductible. There are three classes of memberships:

$7.00 REGULAR MEMBER	Graduate geologists, or eqivalent, with one year of practice in geology, or with an advanced degree.
$6.00 ASSOCIATE MEMBER	Any person or organization desirous of association with the Society.
$4.00 STUDENT MEMBER	Persons currently enrolled as college students.
$2.00 APPLICATION FEE	A one-time fee to all new members, payable when applying for membership.

ANNUAL RENEWAL/APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF MAINE

Regular Member $7.00/year $_____
Associate Member $6.00/year $_____
Student Member $4.00/year $_____
Application Fee $2.00 one time $_____

TOTAL ENCLOSED $_____

NAME _____
(Please print or type)

ADDRESS _____
(Permanent mailing address & zip code)

_____

_____

Please make checks payable to: THE GEOLOGICAL SOCIETY OF MAINE, INC.
c/o Michael Foley
Maine Geological Survey
State House Station 22
Augusta, ME 04333

1990/91 SOCIETY YEAR BEGAN AUGUST 1 - PLEASE SEND IN YOUR DUES

THE GEOLOGICAL SOCIETY OF MAINE
c/o Arthur M. Hussey, II, Department of Geology, Bowdoin College, Brunswick, ME 04011.

THE MAINE GEOLOGIST is published four times a year, more-or-less, in early Fall, mid-Winter, Spring, and maybe Summer, for members of the Geological Society of Maine, a non-profit educational Maine corporation interested in all aspects of the geology of the state of Maine.
Correspondence about membership in the Society should be mailed to Michael Foley, Maine Geological Survey, State House Station 22, Augusta, ME 04333.
Items for inclusion in the newsletter may be directed to Susan Corderman Weddle, 11 Beech Drive, Brunswick, ME 04011.

Nonprofit Organization
U.S. Postage

PAID

Permit No. 20
Brunswick, Maine 04011
Address correction requested