



THE GREEN MOUNTAIN GEOLOGIST

NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

Fall 2002

VOLUME 29

No. 4

VERMONT GEOLOGICAL SOCIETY FALL FIELD TRIP & ANNUAL MEETING

Waterbury, Vermont
September 14, 9:30 AM

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THE GREEN MOUNTAIN GEOLOGIST
 VERMONT GEOLOGICAL SOCIETY
 DEPARTMENT OF GEOLOGY
 UNIVERSITY OF VERMONT
 BURLINGTON, VERMONT 05405-0122

The GREEN MOUNTAIN GEOLOGIST is published quarterly by the Vermont Geological Society, a non-profit educational corporation.

Executive Committee

President	Ray Coish	443-5423
Vice President	Helen Mango	468-1478
Secretary	Jeff Hoffer	476-2002
Treasurer	Kristen Underwood	453-3076
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Public Issues	Laurence Becker
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ADDRESS CHANGE?

Please send it to the Treasurer at the above address.

-Printed on Recycled Paper-

PRESIDENT'S LETTER

August 27, 2002

Dear Members:

I hope you've all had a great summer.

We did have a summer field trip to Fort Mount Independence led by Helen Mango. It was a beautiful day with great geology – thanks Helen. For those of you who missed it, Helen will be running the field trip again for the NEIGC conference in late September – you can get details at www.neigc.org.

Our Fall field trip and meeting will be on September 14 – see details in this issue of the GMG. I hope that many of you can make it to the field excursion and to the meeting that will follow. At that meeting, we will elect a new slate of officers for the coming year. The list is in this GMG - please send in your vote if you cannot make it to the meeting in September. Thanks to all nominees for agreeing to serve the society.

Earth Science Week is the week of Oct. 13 – 19. Many activities are planned around the state, including Geologist-in-the-Park, a poster competition for students and tours of OMYA quarry in Middlebury. Marjie Gale has compiled a list of activities on the Vermont Geological Survey website.

At our executive committee meeting in the summer, we decided to table the issue of a name change for the society until at least the Fall meeting. I hope that we can discuss it then and come to a decision.

Finally, I want to thank all who have helped during my tenure as president, especially Marjie Gale who has given so much of her time to keep the society functioning smoothly. Thanks to Helen Mango for agreeing to take on the job of president next year.

Sincerely,
Ray Coish
coish@middlebury.edu

VGS ANNUAL MEETING & ELECTIONS

Saturday, September 14, 2002

The Fall Field Trip and Annual Meeting will be held on Saturday, September 14, 2002. Archeologist Dr. Peter Thomas will be leading the field trip, which will depart from the Vermont Geological Survey (103 South Main St., The Laundry Building) in Waterbury at 9:30 am. To get to the Survey, take Rte 89 to Exit 10. From Exit 10 go south on Rte 100 to Rte 100 and Rte 2 South. Take Rte. 100 (also Rte. 2) about 1 mile south through Waterbury village. Turn right at the light onto Park Row and drive around to the back parking lots. The Laundry Building is behind the ANR main office complex (in front of a gigantic smokestack visible from the highway). Following the field trip, the Annual Meeting will be held.

The Annual Meeting and Elections will be held at ARVADS, Main St., Waterbury, VT at 4 pm on Saturday, September 14, 2002. Here are nominees for VGS positions next year:

President - Helen Mango
Vice President - Tim Grover
Secretary - Dave West
Treasurer - Steve Howe

Board - Shelley Snyder, Ray Coish, Kristen Underwood
Advancement of Science - Steve Howe
Education - Christine Massey
Public Issues - Larry Becker
Publications - Marjorie Gale, Peter Gale, Dave West
Membership - disband

If you are not planning to attend, please send the enclosed absentee ballot by mail* to the VGS Secretary c/o Marjie Gale by September 13, 2002.

* Marjie Gale, Vermont Geological Survey, 103 South Main St., Laundry Bldg., Waterbury, VT 05671

STATE GEOLOGIST'S REPORT

Isle LaMotte Ordovician Reef B Goodsell Ridge

At a Burlington Boat House kick-off meeting to raise funds to preserve the Goodsell Ridge (a section of the Chazy reefs on Isle LaMotte), the State Geologist introduced Dr. Charlotte Mehrtens, Vermont expert on the Ordovician reef. Her talk highlighted the geology, paleontology, and the educational value of preserving this world-class example of reefs in which coral first appears. The gathering was sponsored by the Lake Champlain Land Trust and the Isle LaMotte Reef Preservation Trust. Please consider this worthy cause to preserve a geologic treasure.

State Based Earth Science Education Alliance

The State Geologist has started to organize a State Based Alliance to advance Earth Science education in Vermont in cooperation with TERC, a Cambridge, Mass. non-profit that publishes science curricula. The Vermont Geological Survey is cooperating with TERC on a grant application to the National Science Foundation. The State Geologist invited the Director of TERC's Center for Earth and Space Science Education to the Association of American State Geologists (AASG) annual meeting in New Harmony, Indiana. He explained the alliance concept and a new national initiative to advance Earth Science education. As chair of the AASG Education Committee, the Vermont State Geologist submitted a resolution for AASG consideration. AASG agreed that State Surveys should consider joining or leading State Based Alliances for Earth Science Education in their own states as changes to meet the new science standards take place on the state and local levels.

Education

Marjorie Gale led a full day geology workshop at Shelburne Farms. The workshop was designed to deliver content in geology to elementary school teachers who had limited science/earth science background. The workshop included lecture, discussion, hands-on rock, mineral, and map activities, and field time. The workshop was

followed by a field day in South Hero in August. Marjorie also spent an afternoon at the middle school in Essex Junction during the annual Career Day.

Jon Kim taught geology at one of the seven field stations at the Tunbridge Central School Environmental Field Day. Over 140 students (in groups of 20) spent 30 minutes at each field station. Jon also led a field trip for an Environmental Geology class from Alfred University (N.Y.). The trip visited the Belvidere Mountain Asbestos Quarry, Lake Willoughby, and the Jeffersonville landslide area.

Earthquake

Emergency Management contacted the State Geologist within 10 minutes of the event on the morning of April 20, 2002. The State Geologist contacted Weston Observatory of Boston College immediately to get the size and location of the quake. Weston manages a seismograph here in the Waterbury complex in cooperation with the VGS. The information was relayed by approximately 8:45 am.

Since we re-set the counter in October 1999, we have an average of 589 hits per month on our web site. On Saturday, April 20 we logged about 400 hits. We probably owe some of the increased traffic to Alice Blount (OMYA) and Vermont Public Radio who posted a link to ANR with the location of our earthquake information (*A Report on the Seismic Vulnerability of the State of Vermont*, by John E. Ebel, Richard Bedell and Alfredo Urzua).

The VGS in cooperation with Vermont Emergency Management employs a FEMA computer program known as HAZUS, a tool for estimating potential losses from earthquakes. On Monday morning, the VGS worked quickly to get HAZUS information into an Emergency Management press release.

HAZUS modeling of the 5.1 Richter magnitude, April 20, 2002 earthquake predicts ground shaking slightly below the damage threshold, consistent with the early reports from the actual event. A simulation of a 5.5 magnitude event at the same location predicts potentially damaging ground shaking in northwestern VT. In general,

northwestern Vermont has a 10% chance of experiencing damaging ground shaking in a 50-year period.

As a result of the press release, both WCAX Channel 3 and WVNY, Channel 22 visited the VGS for interviews on the science of seismic events and the need to prepare for future events that could cause damage in northwestern Vermont.

In an interesting follow up, a consulting firm performing a slope stability analysis for a site in Colchester requested technical data on the level of shaking that occurred in Colchester on April 20, 2002. The Division used HAZUS, which predicts horizontal shaking as a percent of the acceleration of gravity. The consulting firm wanted to know the vertical component. As a general rule, vertical shaking is about 2/3rds of the horizontal push that occurs during earthquake events. The consulting firm will use this information in the slope stability analysis.

Radioactivity in Rocks, Soil, and Water

The VGS met with the towns of Milton and Colchester to explain the results of geologic mapping to define the potential for encountering radioactivity in rocks and drinking water. The VGS discussed the creation of a derivative map distilled for public audiences that will help the towns manage the radioactivity problem.

Geology and Town Plans

A strategic plan goal is to increase the number of town plans that include geological information and address geological issues such as hazards, ground water, and resource needs. In the last several weeks, requests for town plan information have come from Belvidere and Waitsfield. The Waitsfield request is for general geological information to apply to the town plan. The Belvidere gravel pit capacity is finite and the town will be looking for new sources. Also, Belvidere wants to know about extraction potential as mineral rights are owned by third parties on some properties and surrounding towns such as Johnson, Eden and Lowell - all have had active extraction sites. Addison County Regional Planning Commission is putting together a hazard mitigation plan that will include the earthquake, landslide and river erosion issue

Shoreline Erosion - Lake Champlain

The State Geologist attended a steering committee meeting to discuss a Lake Champlain Shoreline Stabilization Handbook. The Northwest Regional Planning Commission is using Project Impact funds to create a handbook. In 1977, as a student, Laurence Becker conducted a survey of Lake Champlain shoreline erosion for Professor Allen Hunt at UVM under contract to the New England River Basins Commission. Because of present day assessment issues and the Survey's physical hazard mapping initiative which applies to lakeshore erosion/slope instability, the State Geologist will track the handbook development. The Director of the Sea Grant program in Vermont was in attendance, but as of now the sea grant monies would not apply to Lake Champlain shoreline erosion issues. There may be an attempt to go back to Congress to get the ability to spend sea grant money on shoreline erosion and other issues.

Personnel

On January 28th, Dr. Jonathan Kim began work in the Vermont Survey as an Environmental Scientist III with an emphasis on geologic hazard mapping. He has broad experience in many aspects of geology and has conducted geologic mapping for radionuclides in the Milton/Colchester area and St. George. His major focus will be work on the radioactivity in rocks and ground water problem but he will also be involved in the identification of physical hazards such as landslides and erosion.

In cooperation with Norwich University, the Survey is supporting a Research Associate position at the Department of Geology. The Research Associate's work will focus on physical hazard mapping that combines the identification of the landslide, slope instability, and riverine erosion hazard. The Research Associate will help develop the physical hazard mapping methodology and map presentation. Completion of mapping in the Third Branch of the White River and future mapping projects will be conducted by the research associate. George Springston, a principal investigator on the Statemap grant that supports the position, has been named as the Research Associate.

Christe Wedlund is volunteering as an intern with the VGS. She is using ArcView GIS to combine the water well database, digital orthophotos, E-911 location data, digital parcel maps, boring logs from AOT and other sources, and information from Town Clerks in order to check locations of water wells and boring logs in Randolph and Bethel. The final product will be a set of accurate well and boring locations that will help the Survey evaluate the three-dimensional distribution of the surficial deposits in the area as part of the Survey's study of surficial geology and fluvial geomorphology. Christe recently graduated from Appalachian State University with a B.A. in Geology.

Laurence Becker, Vermont State Geologist
 Vermont Geological Survey
 103 South Main St., Laundry Bldg., Waterbury, VT 05671

EARTH SCIENCE WEEK 2002, Oct. 13 - 19

Scheduled Events

- Saturday, Oct. 12: OMYA Open House
 Tuesday, Oct. 15: Geologists-in-the-Parks at Button Bay, Elmore, Groton, and Mt Philo
 Fleming Museum Geologic Resource Tours
 Mercury in the Environment Guest Speakers
 Wednesday, Oct. 16: Geologists-in-the-Parks at Elmore and Mt. Philo
 Fleming Museum Geologic Resource Tours
 Mercury in the Environment Guest Speakers
 Thursday, Oct. 17: Fleming Museum Geologic resource Tours
 Mercury in the Environment Guest Speakers

- Friday, Oct 18: Posters due at Perkins Museum: Awesome Forces that Shape the Earth!
 Fleming Museum Geologic Resource Tours
 Mercury in the Environment Guest Speakers
 National Water Monitoring Day
 Saturday, Oct. 19: VINS North Branch Nature Center Mineral ID Day

OMYA's Marble Quarry Open House: As part of the National Earth Science Week celebration, a special open house will take place on October 12th from 10:00 a.m. to 3:00 p.m. at OMYA's marble quarry near Middlebury, Vermont. Experts will be on hand to lead tours into the quarry, to help visitors identify samples that they have collected and to talk about Vermont geology. Modern mining equipment will be available for inspection. For further information: 802-770-7267 or alice.blount@OMYA.com

Geologist-in-the-Parks sponsored by VT Geological Survey, VT Geological Society and Dept. of Forest and Parks: Park sites include Groton, Button Bay, Mt Philo, & Elmore. Spaces are limited and reservations are required. Contact: Marjorie Gale at 802-241-3608 or e-mail marjieg@dec.anr.state.vt.us

Awesome Forces that Shape the Earth! Poster Contest: Perkins Geology Museum at UVM and the Vermont Geological Society are sponsoring a poster contest for Vermont students in grades K-2, 3-5, 6-8, & 9-12. There will be a \$30 cash prize for each grade group. This year's theme is: Awesome Forces that Shape the Earth! (e.g. plate tectonics, earthquakes, volcanoes, tsunamis, glaciers, or even the stream in your backyard). Contact: Christine Massey at 656-1344; cmassey@zoo.uvm.edu

Geologic Resource Tours at the Fleming Museum: Special tours with a geologist to examine geologic materials used in objects and exhibits at UVM's Fleming Museum. Tuesday-Friday, October 15-18, 2002. Contact: Chris Fearon, Fleming Museum Education Specialist, 656-0750.

Mercury in the Environment Guest Speakers: Karen Busshart, Mercury Project Coordinator, and Tom Benoit, Hazardous Materials Specialist, from the VT Dept. of Environmental Conservation will visit your school or group to talk about mercury in the environment. Contact Karen Busshart at 802-241-3455; e-mail karenbu@dec.anr.state.vt.us

VINS North Branch Nature Center Mineral Identification Day: Spend the morning with geologists and mineral collectors to identify your own rocks and minerals, plus learn about common minerals in Vermont. Contact Peter Watt or Chip Darmstadt at VINS, 713 Elm St., Montpelier, VT; 802-229-6206

National Water Monitoring Day: Citizen monitors including families, classrooms, civic organizations and service clubs can participate and sample for a core set of water quality parameters (Temperature, pH, Water Clarity, Dissolved Oxygen). Participants will need to register their monitoring location before October 18th by clicking on <http://www.yearofcleanwater.org>

Vermont Geological Society Booklist: A copy of the booklist may also be obtained from VT Geological Survey, 103 S. Main St., Laundry Bldg., Waterbury, VT 05671.

Earth Science Week is a joint project of the Vermont Geological Society, the Vermont Geological Survey at the Department of Environmental Conservation, the Perkins Museum at the University of Vermont and the American Geological Institute. Other individuals, organizations and businesses also sponsor activities during the week. Please join us for Vermont's Fifth Annual Earth Science Week. Events are posted at: <http://www.anr.state.vt.us/geology/vgshmpg.htm>

For more information about Earth Science Week contact the following.

Christine Massey at 656-1344; cmassey@zoo.uvm.edu
Marjorie Gale at 241-3608; marjieg@dec.anr.state.vt.us

VERMONT GEOLOGICAL SOCIETY BOOK LIST

Many thanks to all of you who contributed to the booklist. This list also has some annotations from various contributors.

Atlantic Geoscience Society, 2001, *The Last Billion Years: A Geological History of the Maritime Provinces of Canada*, Nimbus Publishing, Halifax, NS. "Although the last one is set in Canada, much of the information in it also applies to the NE USA, and it is a wonderful and colorful explanation co-written by a team of real experts. Very impressive." from Greg McHone

Dann, Kevin, 1989, *Traces on the Appalachians: A Natural History of Serpentine in Eastern North America*, Rutgers University Press

Decker, Robert and Decker, Barbara, 1997, *Volcanoes*, W.H. Freeman and Company

Fortey, Richard, 2000, *Trilobite: Eyewitness to Evolution*, Knopf
"...a good read." from Jim Dawson

Keay, John, 2001, *The Great Arc: The Dramatic Tale of How India was Mapped and Everest Was Named*, Harper Perennial. "...a good read." from Jim Dawson

Kohnke, Helmut and Franzmeier, D.P., 1995, *Soil Science Simplified*, Waveland Press

Little, Richard, 1986, *Dinosaurs, Dunes, and Drifting Continents: The Geohistory of the Connecticut Valley*, Earth View (MA)

About McPhee-

"...various works by John McPhee, of course." from Thelma Thompson.

"I would recommend *Rising from the Plains* by John McPhee; Also *Assembling California* and *Basin and Range* by McPhee." from Bob Badger

"Of course for adults, you can't go wrong with anything by John McPhee;" from Kent Koptiuch

Greg Walsh, Paul Bierman and Stephen Wright recommended McPhee, too.

McPhee, John, 1983, *In Suspect Terrain*, Farrar Straus and Giroux (re-issue 1998 in paperback by Econo-Clad Books)

McPhee, John, 1990, *In Control of Nature*, Noonday Press

McPhee, John, 1990, *Encounters with the Archdruid*, Noonday Press

McPhee, John, 1991, *Rising from the Plains*, Noonday Press

McPhee, John, 1994, *Assembling California*, Noonday Press

McSween, Harry J., 1999, *Meteorites and their Parent Planets*, Cambridge University Press

Morrison, Taylor, 2001, *The Great Unknown*, Houghton Mifflin Co.
"Describes the efforts of Charles Wilson Peale to excavate and display the bones of a mastodon unearthed in New York--a great blend of science and history." from Cheryl Cox

Officer, Charles and Page, Jake, 1993, *Tales of the Earth: Paroxysms and Perturbations of the Blue Planet*, Oxford University Press
"...good for the lay person and addresses favorite topics like ice ages, extinctions and man's impact." from Tracy Rushmer

Powell, John Wesley, 2002, *The Exploration of the Colorado River and its Canyons*, National Geographic Society

Raymo, Chet and Raymo, Maureen E., 2001: *Written in Stone: A Geological History of the Northeastern United States (2nd Edition)*, The Globe Pequot Press, Old Saybrook, CT.

Rolando, Victor, 1992, *200 Years of Soot and Sweat: the Geology and Archeology of Vermont's Iron, Charcoal, and Lime Industries*, Vermont Archaeological Society, Burlington, VT

"...a great compendium of Vermont's industrial archeology/geology, but is probably interesting to a narrower audience." from Stephen Wright

Stevens, C.J., 1997, *The Next Bend in the River*, John Wade Publishing
"...a fascinating account of several mini-gold rushes in western Maine in the late 1800s through mid 1900s." from Kent Koptiuch

Strahler, Arthur N., 1988, *A Geologist's View of Cape Cod*, Parnassas Imprints

"...an excellent short book on coastal morphology for the layperson." from Kent Koptiuch

Van Andel, Tjeerd, 1994, *New Views of an Old Planet: A History of Global Change*, Cambridge University Press

"...good for the introductory geology student-a bit more meaty." from Tracy Rushmer

Van Diver, Brad, 1987, *Roadside Geology of Vermont and New Hampshire*, Mountain Press Publishing

"...an obvious choice." from Thom Villars and from Jim Malter

Wieshampel, David B. and Young, Luther, 1996, *Dinosaurs of the East Coast*, Johns Hopkins University Press, Baltimore, MD

Winchester, Simon, 2001, *The Map that Changed the World*, Harper Collins

"...interesting, but personally I think it is overrated." from a shared sentiment

Children/Young Readers Books

Blobaum, Cindy, Illustrated by Michael P. Kline, 1999, *Geology Rocks--50 Hands-on Activities to Explore the Earth*, Williamson Publishing

Christian, Peggy, Illustrated by Barbara Hirsch Lember, 2000, *If You Find a Rock*, Harcourt

Cole, Joanna, Illustrated by Bruce Degen, 1989, *The Magic School Bus Inside the Earth*, Scholastic Trade

Gibbons, Gail, 1998, *The Planet Earth: Inside Out*, Mulberry Books

Hiscock, Brian, 1999, *The Big Rock*, Aladdin Paperback

Hooper, Meredith, Illustrated by Christopher Caody and Chris Coady, 1996, *The Pebble in My Pocket: A History of Our Earth*, Viking Childrens Books

Hurst, Carol Otis, 2001, *Rocks in his Head*, Greenwillow

Kerley, Barbara, Illustrated by Brian Selznick, 2001, *The Dinosaurs of Waterhouse Hawkins*, Scholastic Trade. "a brilliantly illustrated tale of how Hawkins excited the world about dinosaurs" from Cheryl Cox

Martin, Jacqueline, Illustrated by Mary Azarian, 1998, *Snowflake Bentley*, Houghton Mifflin Co.
"...an obvious choice." from Thelma Thompson

Prager, Ellen, J., Illustrated by Nancy Woodman, 2002, *Sand*, National Geographic Society

Thorson, Kristine and Thorson, Robert, Illustrated by Gustav Moore, 1998, *Stone Wall Secrets*, Tilbury House, Gardiner, ME

Vancleave, Janice, 1991, *Janice Vancleave's Earth Science for Every Kid: 101 Easy Experiments that Really Work*, John Wiley

Oldies but Goodies

"I suggest adding these "oldies but goodies":
John S. Shelton: *Geology Illustrated* (Freeman);
Cornelius S. Hurlbut, Jr.: *Minerals and Man* (Random House); and
Ian McHarg: *Design with Nature* (Natural History Press)."
from Jutta Hager

VERMONT GEOLOGICAL SOCIETY TREASURER'S REPORT

August 30, 2002

Dear President and Board:

The financial condition of the Society remains strong. The checking account balance is \$3,762.36 as of August 30, 2002. Please see the attached Income Statement. All bills received by me have been paid and are reflected in the above balance.

Sincerely,
Kristen L. Underwood

Income and Expenses 1/1/02 through 8/30/02

INCOME		
Total Dues		\$1,488.00
Dues-Family	\$120.00	
Dues-Institution	\$70.00	
Dues-Member	\$1,290.00	
Dues-Student	\$8.00	
Interest	\$0.57	
Publications (UVM Geology)	\$30.00	
Credit for Lost Student Check	\$30.00	
Dues Overpayment	\$10.00	
Student Research Grant Contributions	\$270.00	
TOTAL INCOME		\$1,828.57
EXPENSES		
US Post Office (stamps, GMG Dist.)	\$8.50	
GMG Publishing	\$229.57	
Earth Science Week Poster Awards	\$30.00	
Expense Reim. (UVM Geo.)	\$30.00	
Expense Reim. (Postage for GMG)	\$82.30	
Research Grant Awards	\$0.00	
Student Awards (VGS Spring Mtg)	\$225.00	
TOTAL EXPENSES		\$605.37
TOTAL INCOME - EXPENSES		\$1,223.20

ABSENTEE BALLOT
Vermont Geological Society

Officers

President: Helen Mango _____

(write in) _____

Vice-President Tim Grover _____

(write in) _____

Secretary: Dave West _____

(write in) _____

Treasurer Steve Howe _____

(write in) _____

If you will not be attending the VGS Annual Meeting in Waterbury on September 14, please complete this ballot and return it in an envelope marked with "Ballot" in the lower left hand corner and your name and address in the upper left hand corner to:

VGS Secretary
c/o Marjie Gale
Vermont Geological Survey
103 South Main St./Laundry Bldg.
Waterbury, VT 05671

To be counted, this ballot must be received by September 13.