



THE GREEN MOUNTAIN GEOLOGIST

NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

Winter 2002

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WINTER MEETING
February 16, 2002, 9:15 AM
Norwich University

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THE GREEN MOUNTAIN GEOLOGIST
 VERMONT GEOLOGICAL SOCIETY
 DEPARTMENT OF GEOLOGY
 UNIVERSITY OF VERMONT
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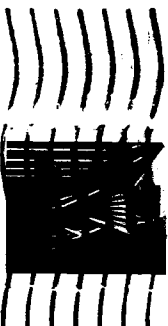
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ADDRESS CHANGE?

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PRESIDENT'S LETTER

Dear Members:

I sit here looking out at a beautiful winter scene just a few days before Christmas and realize I have absolutely no idea how to start this "President's letter". So, let me introduce myself – since 1979, I've been at Middlebury College where I teach courses on bedrock geology of Vermont, earthquakes and volcanoes, mineralogy, petrology, intro geology, and others. My main research interests are in ancient volcanic rocks, particularly their geochemistry.

VGS has flourished for over 25 years on the basis of volunteerism (with a little arm twisting). I've been loosely associated with the society since my arrival but I'm ashamed to say that I have not been as involved as I should have been in keeping it going. I've always left that to others. If everyone had that attitude, the society would have long since disappeared. Fortunately, there have been dedicated members, those who started the society around 1975 and those who have kept it afloat since. VGS provides an important venue for undergraduate development in its spring meeting, keeps academics and professionals in touch via field trips and occasional winter meetings, and reaches out to secondary schools with well-received educational programs.

Since the last GMG appeared, the society hosted a very successful Fall field trip at the OMYA marble quarry in Middlebury. I would like to thank OMYA, especially Andy McIntosh for a very interesting tour. Also, thanks largely to the efforts of Marjorie Gale, Christine Massey, Shelley Snyder, and Alice Blount, Earth Science week was a great success throughout the state. At the meeting following the Fall trip, the society decided to reinstate the winter meeting, which will be held at Norwich University on February 16. I anticipate a stimulating line up of presentations.

I look forward to the coming year and will appreciate any help offered. Let me take this opportunity to thank Shelley Snyder for guiding the society successfully over the last two years. She put a lot of energy

into the society and I hope she'll be available for frequent consultations!

I end this letter on a sad note – Bob Cushman passed away unexpectedly on October 29, 2001. Bob was a USGS hydrogeologist, who retired to Middlebury over 20 years ago. He remained active in geology around Addison County right up to the time of his death. He was a strong supporter of the VGS – in fact, the last time I saw Bob was at the Fall field trip and meeting. I will remember him for his geological acuity, his kindness and his gentle manner.

Sincerely,
Ray Coish
coish@middlebury.edu

VGS CALENDAR FOR 2002

- February 15: Pre-registration Deadline for NE GSA Meeting
- February 16: Winter Meeting, Norwich Univ., Northfield, VT
- March 25-27: NE Geological Society of America, Springfield, MA
- April 1: Deadline for student abstracts for Spring VGS Mtg
- April 1: Deadline for submission of articles - Spring 2002 GMG
- April 1: Student Summer Research Grant Proposals Due
- April 15: Publish Spring GMG
- April 20: Spring VGS Meeting, Middlebury College, VT
- April 20: Student summer research grant money awarded
- June 22: Deadline for articles and news items for Summer GMG
- July: Spring/Summer Field Trip; details TBA
- Sept. 4: Deadline for articles and news items for Fall GMG
- Sept. 18: Publish Fall GMG
- Sept. 27-29: NEIGC, Lake George, New York

CALL FOR ABSTRACTS

Spring Meeting of the Vermont Geological Society
 Spring 2002 Presentation of Student Papers
 Saturday, April 20, 2002, 8:30 am

Hosted by:
 Department of Geology, Middlebury College

The Vermont Geological Society will hold its Spring 2002 meeting at Middlebury College in Middlebury, Vermont. The meeting is dedicated to students conducting research in the geological sciences. Undergraduate and graduate students are encouraged to submit abstracts outlining the results of their research. Abstracts covering all aspects of the geological sciences are welcome and will be published in the Spring issue of the Green Mountain Geologist. The Charles Doll Award for outstanding undergraduate paper will be presented. A cash award for "Best Paper and/or 2nd place" will also be presented based on quality of the research, the abstract, and presentation of the paper.

Abstracts should be limited to one double spaced 8.5 x 11 inch sheet and can include figures. Font size should not be less than 10. Please submit both a paper and electronic copy (e-mail or disk; e-mail preferred) of abstracts, reviewed by the student's advisor, to the editor at the address given below. Disks should include both a formatted and "text only" version of the abstract (either Mac or IBM; IBM preferred). Abstracts submitted by e-mail should be sent to marjieg@dec.anr.state.vt.us.

Oral presentations will be limited to 15 minutes with 5 minutes for questions. Two slide projectors and an overhead projector will be available. Deadline for Abstracts: Monday, April 1, 2002.

Send abstracts to:

Marjorie Gale, Vermont Geological Survey
 103 South Main St., The Laundry Building
 Waterbury, VT 05671-0301

E-MAIL: marjieg@dec.anr.state.vt.us

For additional information contact Ray Coish at 443-5423;
coish@middlebury.edu or Marjorie Gale at 241-3608 (o).

EARTH SCIENCE WEEK 2001

October 7-13 was the fourth annual Earth Science Week sponsored nationally by the American Geological Institute. Governor Dean issued the formal Earth Science Week proclamation on August 13, 2001. The organization and implementation of Vermont's celebration is spearheaded by the Vermont Geological Society, the Vermont Geological Survey, and Perkins Museum at the University of Vermont. This year we began planning in the spring and strengthened our connections with museums, nature centers, and the media in order to expand our reach and find additional groups and sites willing to host special events. The Dept. of Tourism and Marketing included publicity for the week in their fall press kit and on the web site, we maintained a list of events on the Survey web site, and both Shelburne Farms and the Dept. of Forest and Parks included the week's events in their mailings to educators.

Popular annual events were the Geologist-in-the-Parks program, the Perkins Museum Poster Contest, and Fleming Museum Tours. Vermont Geological Survey, the Dept. of Forest and Parks and the Vermont Geological Society sponsored the Geologist-in-the-Parks program on October 9-11. The program reached 400 students, parents and educators at 9 sites. Geologists led hikes during the three days at Owls Head, Little River, Button Bay, Ascutney, Townshend, Branbury, Mt Philo, Elmore and Lake Willoughby parks. We turned away about 200 students. Ginger Anderson and Bruce Amsden of FP&R helped coordinate this event. Geologists participating were Jon Kim, George Springston, Carey Hengstenburg, Rodney Pingree, Jeff Hoffer, Kristin Underwood, Rob Farley, Peter Thompson, Peter Gale, Marjorie Gale, Craig Heindel, and Kent Koptiuch. Laura Hollowell, a naturalist, assisted at Button Bay.

Perkins Geology Museum and the Vermont Geological Society sponsored a poster contest, "Vermont Geologic Resources: What we use in our everyday lives!" The poster contest drew 192 entries as compared to about 40 the previous year. The awards ceremony was held at the museum on October 23. Prizes were donated by the Society, Perkins Museum, the Survey, Barre Granite Museum, and Rock of

Ages Visitor Center. Winning posters were on display in the State House during December.

UVM's Fleming Museum hosted special tours to examine geologic materials used in objects and exhibits. Chris Fearon, Fleming Museum Education Specialist, organized this event and ran group tours for approximately 150 students and teachers.

It was a pleasure to have new events and the increased participation this year. OMYA hosted an open house Saturday the 13th at the marble quarry near Middlebury. Experts led hourly tours, helped visitors identify samples, and discussed local geology. Modern mining equipment was available for inspection. Alice Blount reports that they had a wonderful turnout and it was a successful outreach effort for OMYA. The annual FFA VT Land Judging Contest was held October 12 at Vermont Technical College in Randolph Center. The students viewed four different soil pits and made judgments on the soils' suitability for agriculture, forestry and housing. 170 high school students attended this year. The contest is co-sponsored by VT Ag Teachers Association, USDA-NRCS, and the White River Natural Resources Conservation District. Thomas Villars, a soil resource specialist with NRCS, oversees the contest.

This was the first year for hosting an event here in the Waterbury Complex. Larry Becker, Vermont State Geologist, presented his slide show on "Glaciers, Moraines and Meltwater: Alaska to Vermont." Also, VINS North Branch Nature Center offered "On the Rocks: Geology Mini-Course" for beginners taught by NBNC Educators Chip Darmstadt and Peter Watt and State Geologist, Laurence Becker. We anticipate continued enthusiasm for Earth Science Week and hope that more groups and businesses will join with us next year to meet the demand from the public and promote understanding of Vermont's natural systems. We are most thankful to all the Vermont Geological Society members who donate time and energy during this week and throughout the year to bring geology to the public.

Respectfully Submitted,
Christine Massey and Marjorie Gale

**WINTER MEETING
OF THE
VERMONT GEOLOGICAL SOCIETY**

**Room 085, Cabot Science Bldg.,
Norwich University, Northfield, VT**

Saturday, February 16, 2002, 9:15 AM

After a hiatus for several years, a Winter meeting of the VGS is scheduled for Saturday, February 16, 2001. The meeting will include six talks in the morning, followed by an afternoon lecture/workshop on varves presented by Dr. Jack Ridge of Tufts University.

PROGRAM

09:15 Coffee

09:30 Gregory J. Walsh, US Geological Survey: GEOLOGY OF THE TAGRAGA DE TATA MASSIF, WESTERN ANTI-ATLAS, MOROCCO

09:50 Laurence R. Becker, Vermont State Geologist: GLACIERS, MORAINES, AND MELTWATER: ALASKA TO VERMONT

10:10 Fred D. Larsen, Norwich University: HOLOCENE SLUMPING OF LAKE WINOOSKI VARVES, BERLIN, VERMONT

10:30 Fred D. Larsen, Norwich University: HIGHLIGHTS OF THE LATE-GLACIAL AND POSTGLACIAL HISTORY OF THE RANDOLPH, VERMONT, 7.5-MINUTE QUADRANGLE

10:50 Stephen F. Wright, University of Vermont: SURFICIAL GEOLOGY OF THE JEFFERSONVILLE 7.5-MINUTE QUADRANGLE, NORTHERN VERMONT

11:10 Andrea Lini, University of Vermont: LAKE SEDIMENTS: MONITORS OF PAST AND RECENT ENVIRONMENTAL CHANGE

11:30 – 1:00 PM Break for Lunch (bring your own or venture into town)

1 – 3 PM Jack Ridge, Tufts University: VARVE CHRONOLOGY IN THE NORTHEASTERN U.S., A PRECISE CHRONOLOGY OF LATE PLEISTOCENE EVENTS

Presentations

GEOLOGY OF THE TAGRAGRA DE TATA MASSIF, WESTERN ANTI-ATLAS, MOROCCO

Gregory J. Walsh, US Geological Survey, Montpelier, VT

The talk will informally present recent results of a cooperative USGS - Morocco mapping project from two 1:50,000 sheets in the Anti-Atlas Mountains of Morocco. The talk will focus on the geologic evolution of the northern margin of the West African craton from the Paleoproterozoic Eburnean orogeny to the Carboniferous to Permian Hercynian orogeny.

GLACIERS, MORAINES AND MELTWATER: ALASKA TO VERMONT

Laurence R. Becker, Vermont State Geologist, Waterbury, VT

This talk will focus on how the glacial geology in Alaska helps us to understand Vermont's landforms and glacial history.

Abstracts

HOLOCENE SLUMPING OF LAKE WINOOSKI VARVES, BERLIN, VERMONT

Larsen, Frederick D., Dept. of Geology, Norwich University, Northfield, VT 05663 and Wright, Stephen F., Dept. of Geology, University of Vermont, Burlington, VT 05405

The Fecteau site is located in the town of Berlin on the Barre West, Vermont, 7.5-minute quadrangle 0.68 mi S20°W of the confluence of the Winooski River and its north-flowing tributary, the Stevens Branch. The site is a steep northeast-facing slope underlain by a thick sequence of varved silt and clay deposited in glacial Lake Winooski. Elevation at the site is about 560 ft above sea level; about 45 ft above and 550 ft from the Stevens Branch. Undercutting of the slope during expansion of a parking area for modular homes led to a typical slump with rotated block and exposed scarp in the month of October 1998. The scarp exposed a fault-like contact dipping 16° to the east in the lake-bottom sediments. The contact separated a layer of light gray clayey silt above a thin organic soil with wood fragments, which in turn overlies gray silt. Samples of the wood were collected and stored. The owners of the site quickly graded the slumped material and covered the scarp with rip-rap.

During the 1999 New England Intercollegiate Geological Conference, wood from a two-till site was collected at Culver Brook in the Montpelier quadrangle. In March 2000, the wood from Culver Brook was dated at 11,900 +/- 50 C-14 yrs BP, thus documenting the so-called Middlesex readvance. In October 2000, radiometric dating of wood collected at the Fecteau site was undertaken to determine whether or not the contact in question was possibly related to the Middlesex readvance. The radiometric date reported by Geochron Laboratories is 4090 +/- 60 C-14 yrs BP, which indicates that the contact is not a thrust fault related to glacial readvance, but is probably a low-angle normal fault related to slumping. The conclusion is that a block of Lake Winooski sediment slid down a slope and buried the organic soil with wood fragments during the mid-Holocene about 4090 C-14 years ago. This work was supported by the Vermont Geological Survey.

HIGHLIGHTS OF THE LATE-GLACIAL AND POSTGLACIAL HISTORY OF THE RANDOLPH, VERMONT, 7.5-MINUTE QUADRANGLE

Larsen, Frederick D., Dept. of Geology, Norwich University, Northfield, Vermont 05663

The Randolph quadrangle located in Central Vermont is underlain by belts of north-trending metamorphic rocks and a small area of igneous rocks. The terrain is rugged with relief of 1860 ft. Movement of Laurentide ice during the last glaciation was to the south-southeast based on an indicator fan of erratics derived from the Braintree pluton. Exposures of compact till are common, but have not been studied in detail. Ice-contact deposits are uncommon and only one small esker (?) has been mapped.

Thick varves of Lake Hitchcock, some greater than 3.0 ft in thickness, occur along the Third Branch of the White River and in Ayers Brook valley north of Randolph. The winter clay layer usually is less than 0.5-inch thick and the remaining summer portion consists of fine to very fine sand and silt. Laminations, A- and B-type ripple cross beds, and sinusoidal bedforms are common in the summer portion. Deltas of Lake Hitchcock have not been recognized, however, truncated foreset beds have been mapped at two locations.

The initial lowering of Lake Hitchcock resulted in sheets of pebbly sand and pebble gravel being washed out onto the former lake bottom where each tributary stream entered the main valley. With incision of the Third Branch and its tributaries these initial stream deposits have been left elevated above the streams and have been mapped as fan-terrace deposits.

Numerous stream terraces along the Third Branch and below the fan-terrace deposits are a significant component of the landscape. The terraces are capped by classic fining-upward sequences as formed by meandering streams. Coarse sediment at the base of the sequence is formed in the stream channel and fine sediment at the top is formed by overbank flooding. Lateral migration of the stream across a valley results in a fining-upward sequence of sediments under the flood

plain. On many terraces in the Randolph area there are curved stream channels that were abandoned when downcutting by the Third Branch took place. It appears that after relatively slow lateral migration of the Third Branch across the valley there was a short period of rapid downcutting during which the adjacent flood plain was left elevated as a terrace.

Interbedded fine sand and organic layers with wood fragments occur below a low stream terrace along Ayers Brook north of Randolph. These "ponded" sediments occur at an elevation (650 ft asl) and in an area where thick varves of Lake Hitchcock would be expected to occur. It appears that at this site Lake Hitchcock thick varves were removed by erosion by Ayers Brook and then the area was reflooded. The "ponded" sediments were deposited in a small, shallow basin and eventually covered by channel and overbank deposits of Ayers Brook. Subsequently, 25 ft of downcutting by Ayers Brook has exposed the "ponded" sediments. A sample of peat and wood from the organic layers has been dated at 8700 +/- 150 C-14 years BP (Geochron sample GX-28660).

A small U-shaped mound of fine sand resting directly on lake-bottom deposits at an elevation of 740 ft was mapped as a sand dune. The landform, 1.07 mi, S34°E of the confluence of Ayers Brook and the Third Branch, is evidence of eolian activity after Lake Hitchcock drained and before sand movement caused by the wind was halted by the growth of vegetation.

In June 1998, the Third Branch experienced a greater than 100-year flood. This resulted in rapid lateral cutting and subsequent slumping of loose lake-bottom deposits. The town of Randolph alone experienced damage greater than \$1.4 million to roads and infrastructure. Mapping of surficial deposits in the Randolph quadrangle by the author, Professor Richard Dunn, Nathan Donahue and assistance from Fiona Johnstone, all of Norwich University, was supported by the Vermont Geological Survey.

SURFICIAL GEOLOGY OF THE JEFFERSONVILLE 7.5-MINUTE QUADRANGLE, NORTHERN VERMONT

Wright, Stephen F., Bosley, Andrew C., McGee, Megan A., Guerino, Matthew J., Department of Geology, University of Vermont, Burlington, VT, 05405, swright@zoo.uvm.edu

We present a detailed map and cross-sections depicting the surficial geology of the Jeffersonville 7.5-minute quadrangle based on 4 months of field work conducted during the summers of 2000 and 2001. Research was supported by the Vermont Geological Survey and the U.S. Geological Survey, National Cooperative Mapping Program, under Assistance Award No. 98HQAG2068. Students were also supported through the Research Experience for Undergraduate funds administered by the American Association of State Geologists.

The Jeffersonville Quadrangle lies within the Green Mountains and is traversed by the Lamoille River valley. The surficial geology of the quadrangle is dominated by both till and lacustrine sediments deposited by the late Wisconsinan advance of the Laurentide ice sheet and a series of glacial lakes that occupied the river valleys during retreat.

Striation measurements at high elevations all record the NW to SE flow of the ice sheet, a direction that cuts across the N-S alignment of most ranges in the Green Mountains. At lower elevations, striae are aligned parallel to the Lamoille River valley, indicating the topographic control exerted on the thinning tongue of the ice sheet. The most common till at the lower elevations is relatively loose, has a fine sand or silt matrix, and contains only sparse erratics that are cobble size and larger. This till overlies deformed lacustrine sediments and was deposited during a readvance episode that may correspond to the well-documented Littleton readvance in the Connecticut River valley to the east and the Middlesex readvance to the south dated at 11,900 C-14 ybp (Larsen, 2000) or ~13,950 calibrated ybp.

The bedrock valley of the Lamoille River and smaller tributaries are deeply buried beneath ice-contact, lacustrine, and modern alluvial sediments between the bedrock dam in Fairfax and Ithiel Falls in Johnson. An esker system (esker ridge and associated subaqueous fan

deposits) exposed in the village of Johnson continues west along the Lamoille valley, but is deeply buried. Water well logs have allowed us to partially trace this esker and to document its utility as a high-yield, although hard-water-bearing, confined aquifer. Thick sequences of undeformed, varved lacustrine silt and clay fill much of the valley bottoms. Deltas indicate glacial lake levels in the valley at 1130 ft (345 m, Glacial Lake Winooski), ~800 ft (244 m, Glacial Lake Mansfield), ~720-660 ft (220-200 m, Glacial Lake Vermont).

Except in the vicinity of the Brewster River delta, near Jeffersonville, Holocene river terraces are rare and occur at elevations less than 50 ft (15 m) above the modern flood plain of the Lamoille river. In most areas alluvium beneath the modern floodplain is less than 5 m thick. The implication is that the Lamoille River has only eroded ~20 m of lacustrine sediments since the last glacial lake drained from the valley, i.e. an almost complete section of glaciofluvial, glaciolacustrine, and glaciotectonic (readvance) sediments lies buried beneath the valley.

LAKE SEDIMENTS: MONITORS OF PAST AND RECENT ENVIRONMENTAL CHANGE

Lini, Andrea, Dept. of Geology, University of Vermont, Burlington, VT, 05405, alini@zoo.uvm.edu

New England has numerous lakes that provide a temporal record of surface and lacustrine processes that have been influenced by both natural environmental change and human activities. Often these changes affect biological communities in and around lakes, thus much of the paleoenvironmental information stored in the sedimentary record can be inferred from the analysis of sedimentary organic matter. In addition, the abundance as well as the temporal distribution of layers consisting mostly of inorganic matter (e.g., sand, silt, and clay) can provide very valuable information about processes active in a lake's watershed. For example, such layers can be used to infer frequency and magnitude of paleostorms.

We have investigated numerous lake records in Northern New England focusing on two distinct time intervals: a) the last glacial-postglacial transition and, b) the more recent post-settlement period. Analyses of these two time intervals provide significant insight into the

response of lake ecosystems to environmental change at different resolutions (yearly vs. centennial and millennial). The last glacial-postglacial climatic transition allows us to investigate how, and at what rates, watershed and lake ecosystems were established on once glaciated, carbon and nutrient-poor landscapes. Detailed records of isotopic ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) and elemental composition (%C, %N, C/N ratios) produced for ten post-glacial lakes in northern New England have documented the individualistic response of lacustrine ecosystems to deglaciation. The sedimentological and isotopic data show that in the studied lakes aquatic communities were not fully established until about 500 to 3000 years after the glaciers left, thus giving indications about the time necessary for lacustrine biota to recover from extreme climatic events.

Many Vermont lakes contain excellent records of human-induced events that have altered the ecological balance of the watershed and the productivity of the lake, such as: settlement, clear-cutting, farming, grazing, and industry. In collaboration with the VT Dept. of Environmental Conservation, we are investigating the use of stable isotopes and elemental composition of sedimentary organic matter as tracers for land-use change and cultural eutrophication in a number of VT lakes. The data obtained so far suggests that fluctuations detected in the geochemical records of lake sediments can be linked to specific human disturbances. In particular, the signals of logging and farming are easily identifiable and were found in several of the studied lakes. Nevertheless, further study is required to explain some of the patterns common to all of the study lakes, and for which catchment-scale human disturbances can only partially account for the observed fluctuations.

VARVE PRESENTATION & WORKSHOP

VARVE CHRONOLOGY IN THE NORTHEASTERN U.S., A PRECISE CHRONOLOGY OF LATE PLEISTOCENE EVENTS

Jack Ridge, Dept. of Geology, Tufts University, jack.ridge@tufts.edu

Topics to be covered include:

1. The existing varve chronologies in the northeastern United States and the history of their development,
2. The construction of outcrop varve sequences and how they are matched to a master chronology,
3. The use of varve chronology as a means of constructing time scales for deglaciation and late glacial climate change,
4. Calibration of the varve chronologies with radiocarbon ages and palaeomagnetism, and
5. Important events (climatic and non-climatic) recorded by the varves themselves.

The talk will also touch on depositional mechanisms for glacial varves. About 20 varve cores from northern New England will be available so people can see what they look like and their variety.

(The presentation by Dr. Jack Ridge is supported by the Larsen Fund, an endowed gift from alumni and friends to support science lectures at Norwich University.)

DIRECTIONS TO NORWICH

Norwich University is located on VT Route 12, a mile south of the center of Northfield. It can be reached from I-89 by taking Exit 5 and following Route 64 west to Route 12, and then north to the university. Coming from the north, it's a toss up which is easier/quicker, using the interstate or taking Route 12 south from Montpelier. The Geology Department is located in Cabot Science, the southeastern most brick building on campus, just west of Route 12. The entrance is near the northeast corner of the very large white Kreitzburg Library which can't be missed. The easiest parking for the meeting will be in the commuter lot opposite the Science/Engineering complex on the east side of Route 12.

STATE GEOLOGIST'S REPORT

Drought and aquifers: The State Geologist attended a meeting co-sponsored by Senator Jefford's office and VT Emergency Management to air concerns about the drought. Senator Leahy's and Representative Sander's Offices were also in attendance. The State Climatologist, Leslie-Ann Dupigny-Giroux (UVM) and the Water Supply Division summarized the existing monitoring data that indicate drought conditions. The State Geologist discussed the drying up of shallow sources such as dug wells and of springs that are often served by the declining water table aquifer. Even the artesian wells drilled into fractured rock are dropping in yield. Much discussion focused on loan programs to help with drilling bedrock wells and getting truckloads of water to homeowners. In the closing discussion on long-term solutions, the State Geologist noted how the drought shows the importance of ground water to individuals and the economy of Vermont. We need to better understand the aquifer resources of the State to supply groupings of houses, farms, and municipalities to provide sustainable yields during extended dry periods. Staff to Senator Jefford's Committee on Environmental and Public Works were very interested in following up on research into the identification of aquifer resources.

Radionuclides: Jon Kim gave a talk entitled "Geologic Context of Elevated Radionuclide Occurrences in Northwestern Vermont" at Johnson State College on Dec. 12 as part of a weekly environmental lecture series. The Division will work with the Environmental Program at Johnson State to involve students in some aspects of future radionuclide research. The Division is already co-sponsoring a senior thesis at Middlebury College that will focus on the geologic basis of an airborne uranium anomaly in the Starksboro/Monkton area. This study will utilize field mapping, gamma ray spectrometer surveys, radon measurements, and water well radionuclide testing. The geologic information gathered in this investigation will be a valuable addition to the Geology Division's radioactive hazard mapping program.

Science education: The Division of Geology and Mineral Resources was an exhibitor at the third annual Pathways to Standards-Based

Science Conference in Rutland. The conference provides an opportunity for us to learn about science curriculum and the needs of Vermont educators, showcase classroom resources available through the Division, and to meet and brainstorm with others about our educational outreach programs. This year the Division shared a booth with the Perkins Museum, one of our Earth Science Week partners, and focused on that program.

State bedrock map progress: As many of you are aware, the Vermont Geological Survey and the US Geological Survey, in conjunction with geologists from the University of Vermont and elsewhere, are in the process of producing a new bedrock geologic map of Vermont at a scale of 1:100,000. The project was delayed with the passing of Rolfe Stanley, one of the Chief Editors. Nick Ratcliffe, Chief Editor from the USGS, is now working with Marjorie Gale and Peter Thompson who have adapted to their new roles as Associate Editors. We are continuing to make progress on the bedrock map and spent field time this summer reviewing geology in various areas throughout Vermont and fine-tuning linework so that the northern and southern maps could be joined. This fall maps were edited based on additional field data, review of previous works, and new age data which impact stratigraphic and structural interpretations. As the New Year begins, the northern Vermont one-degree sheets have been compiled and preliminary edits are complete. Linework on the master mylar (which will be submitted for peer review) is finished and the northern map has been forwarded to USGS so that linework for the southern portion of the map can be added at the join. The plan is for the map to be produced as five sheets: three contain the linework and two contain descriptions, references, geochronological data, metamorphic data, a tectonic map and cross-sections. Additional edits will be completed next summer/fall based on resolving questions from the scientific review process. Following peer review, the map will go through technical editing and a final version will be prepared. That version will enter production where it will be scribed, digitized, and published. We greatly appreciate the contributions and commitment to the project from the geologic community.

Respectfully Submitted,
Laurence R. Becker, State Geologist

VGS ANNUAL MEETING & ELECTIONS

Saturday, October 20, 2001

Following an excellent field trip to OMYA's Middlebury quarry (many thanks! to OMYA geologist Andy McIntosh), a general membership VGS meeting and election of officers was held at Middlebury College.

Election results and committee chairs for 2002 are as follows:

President: Ray Coish
 Vice President: Helen Mango
 Secretary: Jeff Hoffer
 Treasurer: Kristen Underwood

Board of Directors: Shelley Snyder, Kristen Underwood,
 and Stephen Wright

Geological Education Committee Chair: Christine Massey
 Public Issue Committee Chair: Larry Becker
 Publications/Editorial Committee Chair: Marjorie Gale
 Advancement of Science Committee Chair: Stephen Howe

Following the elections, several general membership items and ideas were discussed. Stephen Howe announced the award of a \$425 research grant to Middlebury student Parham Gardner. VGS is now reviewing grant proposals on an annual basis. Stephen mentioned the possibility of publishing a Vermont Geology publication, with the possible inclusion of detailed field trip guides. Stephen also indicated an interest in reviving a winter meeting, and a discussion of possible formats were discussed.

Respectfully submitted,
 Jeff Hoffer
 VGS Secretary

ADVANCEMENT OF SCIENCE COMMITTEE

The Advancement of Science Committee has been busy initiating several projects proposed at the Fall Annual Meeting. The Committee felt strongly that it was important to resume the Winter Meeting on an annual basis to provide our professional members with a forum to present results of their current research. To this end, our Winter Meeting will be held at Norwich University on Saturday, February 16, 2002, to include a workshop on varves coordinated by Fred Larsen and featuring Jack Ridge. We have recently received approval to establish a website for the Vermont Geological Society on the University of Vermont's main server. We are currently in the process of developing content for the site during its construction phase. Finally, plans are being drawn up for two new issues of Vermont Geology that the Committee hopes will be published in the next year or two.

Stephen S. Howe
 Chair, Advancement of Science Committee

NEW HAMPSHIRE LICENSING GEOLOGISTS

Administrative rules for the licensing of geologists in New Hampshire were adopted effective July 2, 2001. Applications are being accepted for licensure without examination until June 30, 2002. Applications can be obtained by submitting name and address via e-mail to dlobdell@nhsa.state.nh.us, fax (603-271-6990), phone (603-271-2219), or downloading the forms from www.state.nh.us/jtboard/geo.htm

For additional and background information, visit the New Hampshire Council of Professional Geologists website: www.nhpcpg.org

NEW YORK STATE

The New York State Council of Professional Geologists (NYSCPG) is continuing with its efforts to promote the profession and the licensing of geologists. NYSCPG and its lobbyists are optimistic that the proposed licensure bill will pass into law in 2002. For additional information and to become a supporting member, please visit NYSCPG's website: www.nyscp.org

YOU MIGHT BE A GEOLOGIST IF . . .

You can pronounce the word "molybdenite" correctly on the first try.
 You think the primary function of road cuts is tourist attractions.
 You own more pieces of quartz than underwear.
 You associate the word "hard" with a value on the Mohs scale instead of "work".
 Your rock collection weighs more than you do.
 You don't think of "cleavage" the same way everyone else does.
 You follow when you see the local university's geology class going on a field trip.
 You associate the name "Franklin" with New Jersey instead of "Ben".
 Your spelling checker has a vocabulary that includes the words "polymorph" and "pseudomorph".
 Your children are named Rocky, Jewel, Crystal, and Beryl.
 You think there's nothing wrong with looking at the stone facades of buildings with your hand lens.
 You've ever spent more than ten dollars for a book about rocks.
 You shouted "Obsidian!" to a theater full of movie-goers while watching "The Shawshank Redemption".
 You find yourself compelled to examine individual rocks in driveway gravel.
 You're planning on using a pick and shovel while you're on vacation.
 You think Herkimer, New York might be a cool place to go on a vacation.
 You've taken a copy of Dana's Manual of Mineralogy to the bathroom.
 You still think pet rocks are a pretty neat idea.
 You never throw away anything.
 You get excited when you discover a hardware store that stocks 16 pound sledge hammers and 5 foot long pry bars.
 Your employer has asked you not to bring any more rocks to the office.
 You file stratigraphically yet can find important files faster than your secretary.
 You decide not to get married because you'd rather keep your rock collection.

excerpted from <http://geology.csusb.edu/geoclub/ymbgeo.html>

VGS TREASURER'S REPORT

The financial condition of the Society remains strong. Please see the Income Statement for the period January 1, 2001 through December 31, 2001. Expenses exceeded income for the calendar year, largely due to the Society's renewed focus on awarding student research grants. Two student grants were paid out this year, one of which was applied for and awarded in calendar year 2000. The checking account balance is \$2,570.60 as of December 31, 2001. All bills received by me have been paid and are reflected in the above balance. I welcome feedback and suggestions from the Board and membership.

Kristen L. Underwood
 December 31, 2001

Income and Expenses
 1/1/01 through 12/31/01

INCOME

Total Dues	\$833.00
Dues-Family	\$120.00
Dues-Institution	\$0.00
Dues-Member	\$705.00
Dues-Student	\$8.00
Interest	\$11.78**
Publications	\$22.00
Student Research Grant Contributions	<u>\$305.00</u>
TOTAL INCOME	\$1,171.78

EXPENSES

US Post Office (stamps, GMG Distribution)	\$163.40
Minuteman Press (GMG Publishing)	\$369.64
Earth Science Week Poster Awards	\$90.00
Research Grant Awards	\$772.60
Student Awards (VGS Spring Mtg)	<u>\$155.00</u>
TOTAL EXPENSES	\$1,550.64

TOTAL INCOME - EXPENSES

(\$378.86)

** Does not reflect interest from October, November, December.

VERMONT GEOLOGICAL SOCIETY - DUES STATEMENT 2002

Membership dues for 2002 are \$15.00 for Members and Associate Members, \$20.00 for a Family Membership with one newsletter subscription, and \$8.00 for Student Members. Membership dues are used to publish the *Green Mountain Geologist*, to finance our Student Research Grants, and to cover the costs associated with meetings and field trips. If your address, phone, or e-mail address has changed since last year, please fill in this information below, if not, just give your name. A new membership directory will be published with the Summer *GMG*. Return this form with your check for the appropriate amount made payable to the Vermont Geological Society by March 30, 2002. Thank you.

Date: _____ Check No.: _____
 Name: _____
 Affiliation: _____
 Street or Box: _____
 City, State, ZIP: _____
 Work Phone: _____
 Home Phone: _____
 Fax No.: _____
 e-mail address: _____
 Circle Type of Membership:

Member (\$15) Student Member (\$8) Family (\$20)

Amount Due: _____

Add't Contribution to VGS Research Grants: _____

Total Enclosed: _____

Send to:

Kristin Underwood, Treasurer
 2852 South 116 Road
 Bristol, VT 05443

VGS STUDENT RESEARCH GRANTS

are designed to aid our future geologists investigate Vermont's geo-history. Please consider helping the VGS promote a deeper insight into Vermont Geology. Students receiving assistance through the program will present their research results at the VGS Spring Meetings. Your generosity will help cover a lot of terrane!

To contribute to the VGS Student Research Grant Program, please include your contribution with your dues statement, or clip or copy this form and send it, along with your check or money order made payable to the Vermont Geological Society, to:

Kristen Underwood, VGS Treasurer
 2852 South 116 Road
 Bristol, VT 05443

➤ I've enclosed my tax-deductible contribution to be dedicated to the VGS Student Research Grant Program.

TOTAL GIFT \$ _____

NAME: _____

ORGANIZATION: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____