



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

VGS Website: <http://www.uvm.org/vtgeologicalsociety/>

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PRESIDENT'S LETTER

As I near my 17th anniversary of moving to Vermont, through your votes, I will now take a pull as President. So how did I get here? At the 1996 NEGSA in Buffalo, Rolfe Stanley and Marjie Gale said they had “an area” for me to map and convinced State Geologist Larry Becker to hire me as a contractor straight out of graduate school at SUNY at Buffalo. On Memorial Day weekend of 1996, with all possessions in/on a 1982 Toyota Camry, I moved to Vermont from Buffalo, N.Y. to start work in a field area that encompassed parts of Albany, Eden, and Lowell. Having signed the contract before visiting northern Vermont, I overcommitted a bit to the amount of real estate I said I'd map and that first project took me a bit longer than expected to complete. Out of necessity that year, I also landed additional jobs as Adjunct Instructor at Johnson State College (two semesters), and Ski Instructor at Smugglers Notch Resort (still do it). The contractor situation bloomed into a full-time position at the Vermont Geological Survey in the fall of 1997 and I have worked there until the present.

After conversations with the Executive Committee of the Vermont Geological Society (VGS) and the Lake Champlain Research Consortium (LCRC), we will have a joint meeting of the VGS and LCRC on Saturday April 27, 2013 at the University of Vermont. As you know, this is the meeting where current undergraduate and graduate student research is presented. We are currently working on the venue, but it will either be the Aiken Center or the Dept. of Geology. The plan is to run VGS and LCRC talks in separate, but nearby lecture rooms. Some of the students that are funded by LCRC will have to give a talk in each session. The LCRC and VGS will share the food and beverage costs as well as setup and breakdown tasks.

For the Vermont Geological Society summer field trip, Pat and Tom Manley of the Geology Dept. at Middlebury College have offered to run a cruise on Lake Champlain in their research vessel. The goals of the trip will be to demonstrate the use of their survey equipment and discuss their research. The vessel has a capacity of 10-15 visitors, so if more members than this sign up, more than one cruise will be run. The cruise will run a maximum of two hours and will leave from the docks on Thompson's Point in Charlotte on Saturday August 24, 2013. Early this summer, I will establish a signup sheet so you can contact me for cruise(s) reservations. We anticipate that Stephen Wright from UVM will lead a surficial geology trip to the Killington area in the near future (fall?).

We will not have a traditional winter meeting this year. I received mixed responses from the VGS Executive Committee whether we should pursue a winter meeting this year or the future. I welcome responses from other VGS members regarding this issue. As a substitute, we are jointly pursuing, with the New Hampshire Geological Society, a guest lecture by Doug Howard from the U.S. Geological Survey in Reston, VA. Although Doug is currently the Director of the STATEMAP Program, which funds mapping by state geological surveys, he formerly did research associated with the exploration of Mars. While on a field visit to the Vermont Geological Survey this past summer, we talked to him a good deal about his fascinating former work, which would be the focus of his talk.

Last fall, I attended a memorial celebration for John Carmola at the top of a mountain in Belvidere. John is the VGS member who died last summer in a swimming accident in North Carolina. The site of the memorial service was in and around the high elevation glacial potholes that John, friends Paul Madden and J.D. Thoren, recently worked on with Stephen Wright of UVM. There were dozens of family, friends, and colleagues of John there for this event and it was truly a celebration.

Respectfully submitted,
Jon Kim



John Carmola and Friends, Field Trip, 2011

ANNUAL MEETING MINUTES & ELECTION RESULTS

Elections were conducted using Survey Monkey. The following officers were elected for the 2013-2014 year:

President	Jon Kim
Vice-President	Keith Klepeis
Secretary	Dave West
Treasurer	David Westerman

TREASURER'S REPORT

The Vermont Geological Society finds itself in a healthy financial position, thanks entirely to the generous support from its members. Cash on hand as of December 2012 remained steady with a balance of \$6,316. Since then we have received \$728 in membership renewals and new membership dues, and \$460 as contributions to the Society's Research Grant Program. Paper-copy of dues renewal notices are being sent to the remaining 56 members in good standing who

did not respond to the electronic solicitation.

Research awards of \$700 each were recently made to:

Natashia Pierce, Master's Degree candidate at the University of Cincinnati
Geochemical analysis of meta-volcanics in the Rowe-Hawley Zone of northern Vermont: Testing tectonic models

Juliet Ryan-Davis, undergraduate student at Middlebury College
Origin of the Moretown Formation, Vermont: A detrital zircon study

Eric Weber, undergraduate student at the University of Vermont
Analysis of microstructures near the southern terminus of the Hinesburg Thrust Fault

Please join me in welcoming the following new and returning members (M), associate members (A) and student members (S):

Gretchen Gotlieb (M), Cardno ENTRIX, Houston, TX

Vera Lawson (S), Moss Landing Marine Labs, California State University - Monterey Bay, CA

Virginia Irvine (M), ECS, Inc., Brimfield, MA

Joseph Schmidl (M), Stone Environmental, Inc., Montpelier, VT

Tom Eliassen (M), Vermont Agency of Transportation, Montpelier, VT

Andrew Fraser (M), AEF Consulting LLC, Johnson, VT

No expenses have been incurred since the last Treasurer's report.

Respectfully submitted,

David S. Westerman, Treasurer

ADVANCEMENT OF SCIENCE COMMITTEE REPORT

Congratulations to recipients of the VGS Research Grants: Natashia Pierce, Juliet Ryan-Davis, and Eric Weber. Their proposals were submitted to the Vermont Geological Society Research Grant Program by the October 1, 2012 deadline and judged to merit full funding. The awards are announced in the Treasurer's Report above.

The next deadline for proposals to the Vermont Geological Society Research Grant Program is April 1, 2013. Applications should be sent to our new address (as of Feb. 25): Jon Kim, Vermont Geological Survey, 1 National Life Drive, Davis 2, Montpelier, VT 05620-3902. All proposals must be postmarked by the deadline. For details, see the following link:

<http://www.uvm.org/vtgeologicalsociety/grantpolicy.html>

Respectfully submitted,

Jon Kim, Chair

CALL FOR STUDENT ABSTRACTS SPRING MEETING OF THE VERMONT GEOLOGICAL SOCIETY

The Spring 2013 meeting will be held on Saturday, April 27th at the University of 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. Cash awards for the top three papers will also be presented based on quality of the research, the abstract, and the presentation of the paper.

Abstracts should be prepared using the style employed for abstracts submitted to Geological Society of America meetings (maximum of 2,000 characters without spaces). We encourage speakers to send their abstracts electronically as a Word file with a doc or docx extension attached to an e-mail message to Marjie Gale (Marjorie.gale@state.vt.us)

Oral presentations will be limited to 12 minutes with 3 additional minutes for questions. A computer projection system is available for PowerPoint presentations.

Deadline for abstracts: Friday, April 5, 2013 at 5:00 pm



2012 SUMMER FIELD TRIP, CRAFTSBURY, VT

VERMONT STATE GEOLOGIST'S REPORT

Geologic Map Advisory Committee Meeting – October, 2012

The STATEMAP Geologic Map Advisory Committee, chaired by Kristen Underwood, met to help the Vermont Geological Survey (VGS) set mapping priorities for the 2013 Field Season. The Town of Bristol attended the meeting for a second year to make a compelling case to continue the mapping into the north half of the adjacent quadrangle to Bristol known as South Mountain. Jon Kim and George Springston are mapping in the Bristol Quad with planned completion in May 2013. However, the boundaries of the Town are within the Bristol and South Mountain quads. The Town sees geologic maps as integral to Town planning in relation to review of proposed developments including the Act 250 process, groundwater source protection, siting of wastewater treatment, gravel extraction, and hazard mitigation review. They see the need for maps showing depth to bedrock, potential high yielding aquifers, groundwater flow directions, landslide potential and location of aggregate deposits. Bristol also fits with our long range interest in geologic mapping and groundwater quality concerns related to radionuclides and arsenic. A new developing concept for comprehensive groundwater characterization of targeted watershed was added to the long range mapping plan - another aspect of water related studies. As a secondary priority surficial geologic studies in the Joes Pond quadrangle will be considered as part of the USGS Sleeper's River Research Watershed (SREE). Additional data and understanding can apply from the SSRE to a watershed initiative that the VGS is proposing for the Department of Environmental Conservation Strategic Plan.

Planned partnership with State Climatologist

Leslie-Ann Dupigny-Giroux, the State Climatologist at the UVM Geography Dept. and the VT State Geologist plan to partner to provide information to a NOAA drought planning web site. Through a NOAA grant application, Dr. Dupigny-Giroux will provide student interns to help bring existing groundwater information that the Vermont Geological Survey has developed into the necessary formats for access by NOAA. Students will also be able to help develop new VGS data sets. The groundwater resource is a safeguard in times of meteorologic and hydrologic drought. Water is stored in a natural condition and accessed through wells and springs. Groundwater discharge helps to sustain surface water flows in summer and early fall. As groundwater seeps into rivers and streams, water at mean annual temperature lowers surface water temperature supporting aquatic life during the heat of summer.



Bascom Fm., St. George

USGS National STATEMAP Program Visitor from Reston

Doug Howard, USGS National Coordinator for the STATEMAP Program, visited State Surveys in New England reaching the Vermont Geological Survey on Sept. 20 and 21. We explained our geologic mapping program, showed maps, and then conducted a field visit to view examples of Vermont bedrock and surficial geology.

Post-Fukushima Seismic Review Documents for Nuclear Power Plants

The State Geologist has been reviewing four interrelated Electric Power Research Institute and Nuclear Regulatory Commission documents that bear on seismic evaluation requirements. In *Central and Eastern U.S. Seismic Characterization for Nuclear Power Plants*, he is concerned that a historic earthquake recently projected to a higher magnitude in Central NH has not been considered in the characterization. This could affect calculations for the projected shaking at the Vernon nuclear facility. In the *Screening, Prioritization and Implementation Detail* document, he is concerned that new information is needed to have a defensible understanding of what kind of shaking could occur beneath the cooling tower safety cell. Applicants are only required to use existing information from the original license to follow the screening requirements but the material that underlies the cooling tower can be complex based on its glacial origin. In the mid 2000's, new detailed boring information was needed to fully understand seismic safety in the materials underneath the dry fuel storage pad proposal.

Central Vermont Public Service and Geothermal

The Vermont Geological Survey received a supplemental Department of Energy geothermal grant. The supplemental award is to collect water temperature data in wells and obtain rock samples to test for thermal conductivity and geochemical parameters. Central Vermont Public Service (CVPS) in a Sept 28, 2010 letter supported the application and agreed to provide seed money if the grant is approved. In 2011, an internal CVPS renewable resource committee approved the proposal. The original request was for \$5,000 but the committee approved \$15,000. In October, the administration approved the signed grant releasing funds to be spent on the project. On Oct 12, 2012, the VGS reported on study progress to CVPS now owned by Green Mountain Power.

Geothermal Geologic Studies

21 plugs from rock outcrops collected by Marjorie Gale and Abigail Ruksznis were sent to Southern Methodist University (SMU) in Texas. SMU ran density and thermal conductivity analyses of the samples at elevated pressure (to close small fractures and mimic rocks at depth). Running multiple orientations of the same sample will allow us to better understand thermal conductivity differences in rocks. We will also have chemical analyses run on these samples. Data may be used to model temperatures at depths of up to 15,000 feet in Vermont. Jon Kim has begun collecting water well temperature data in deeper water wells in cooperation with Ed Romanowicz of Plattsburgh State.

Data Delivery to U.S Department of Energy (DOE):

The Agency of Natural Resources GIS group (Peter Telep) worked with Marjorie Gale to deliver the new bedrock map, the surficial map GIS data, and water well data as a web map service as part of the DOE National Geothermal Data System (<http://www.stategeothermaldata.org/>). We delivered a series of georectified map images of radioactivity data (Kim, Jonathan, Compiler, 2002, *Compilation and Assessment of Radioactivity Data in Vermont: Vermont Geological Survey General Interest Publication*) as it relates to heat production in deep rocks.

Heat Pumps

As part of this year's deliverable on the Geothermal Technologies grant, Marjorie Gale coordinated with Scott Sawyer of the Vermont State Jobs Fund and Renewable Energy Atlas of

NATURAL RESOURCES

ATLAS - The Vermont Agency of Natural Resources (ANR) recently launched a new Natural Resources Atlas web application posted at <http://anrmaps.vermont.gov/websites/anra/>. The atlas provides geographic information about environmental features and sites that the ANR manages, monitors, or regulates. In addition to standard map navigation tools, this site allows you to generate reports, export search results, import data, search, measure, mark-up, query map features, and print PDF maps.

ERIE PROGRAM - The University at Buffalo's Ecosystem Restoration through Interdisciplinary Exchange (ERIE) Program is excited to announce our 2013 Summer Stream Ecosystem Restoration Workshops and Professional Certificate Program. Registration is now open! Topics include fluvial geomorphology, stream ecology, invasive species, stream assessment, restoration design, and more. Visit the website for more information: <http://www.erie.buffalo.edu/training/SummerCoursemainpage.php>

Vermont to obtain information about installed heat pumps. Data is scarce but Scott is emailing people in hopes of obtaining more data about their heat pump systems. She also contacted Cindy Parks with VT DEC about permits issued for underground injection wells, some of which are geothermal systems. Most of the permit materials were lost in the flood but we were able to connect with operators of several larger systems in state buildings and obtain some data about the number of supply wells, depth, yield, and the type of system.

Respectfully submitted,
Laurence R. Becker, State Geologist

ANNOUNCEMENTS

MAP EXHIBIT COMING SOON TO PERKINS MUSEUM - The 2011 Bedrock Geologic Map of Vermont will be on permanent display in the Perkins Museum later this spring. MajaDesign worked with Char Mehrtens and Marjie Gale to create a 4 panel full size map exhibit funded by a generous contribution from the Lintilhac Foundation. More details TBA.

STUDENT RESEARCH GRANT APPLICATIONS - Students and secondary school teachers are encouraged to apply to the VGS Research Grant Program by April 1, 2013. Downloadable Research Grant Program applications are available from the Society's website at <http://www.uvm.org/vtgeologicalsociety/>. For those without Internet access, forms may be obtained by writing to Jon Kim at the Vermont Geological Survey, 1 National Life Dr., Davis 2, Montpelier, VT 05620-3902, e-mail: jon.kim@state.vt.us, or by calling (802) 522-5401.

SUMMER FIELD TRIP - Preliminary announcement: Tom and Pat Manley (Middlebury College) expect to take us in small groups for 2 hour excursions on board their research vessel on Lake Champlain on August 24. Details will be announced as summer approaches.

ON THE MOVE - At the end of February, the Vermont Geological Survey will be moving to their new home at 1 National Life Drive, Davis 2, Montpelier, VT 05602-3902.

FIND MAPS – Find maps in paper, as electronic images or as digital data through the National Geologic Map database (NGMDB) at: http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html

WHERE'S IT, WHAT'S IT?

Send me an e-mail (marjorie.gale@state.vt.us) with the Vermont town name and a brief description of what is in the picture. All correct entries will be entered in a drawing for a copy of the 2011 Bedrock Geologic Map of Vermont. Look for the answers in the GMG Spring Issue along with another puzzler. Feel free to contribute your own Vermont puzzlers too.

CALENDAR

- February 11: Geology Lecture, UVM, Delehanty, Rm 219, Trinity Campus, 4:15 pm
Andrew Schroth presents "The Evolution of Riverine Metal Fluxes to the Gulf of Alaska: Variability in Provenance, Speciation, Time and Space"
- February 21: Geology Lecture, UVM, Delehanty, Rm 219, Trinity Campus, 4:15 pm
Julia Perdal presents "How Does Carbon in the Critical Zone Respond to Changes in Climatic Forcings?"
- March 11: Geology Lecture, UVM, Delehanty, Rm 219, Trinity Campus, 4:15 pm
Chris Gerbi presents "4D lithospheric strength: causes and consequences"
- March 18-20: Northeastern Section Meeting, Geological Society of America, Bretton Woods, NH
- March 25: Geology Lecture, UVM, Delehanty, Rm 219, Trinity Campus, 4:15 pm

(Calendar, continued)

	Juliet Crider presents "What follows a 'failed eruption?' Inferring the presence of magma beneath Mount Baker volcano, Washington"
April 1:	Student Research Grant Program applications due
April 5:	Student abstracts for Spring Meeting due
April 5:	Executive Committee reports due
April 27:	Spring Student Research Meeting, University of Vermont
August 24:	Summer Field Trip on Lake Champlain
Sept. 23-24:	National Ground Water Association Conference on Groundwater in Fractured Rock and Sediment, Hilton Burlington, Burlington, VT

The **Vermont Geological Society** is a non-profit educational corporation. The **Executive Committee** of the Society is comprised of the Officers, the Board of Directors, and the Chairs of the Permanent Committees.

Officers

President	Jon Kim	(802) 522-5401	jon.kim@state.vt.us
Vice President	Keith Klepeis	(802) 287-8387	keith.klepeis@uvm.edu
Secretary	David West	(802) 443-3476	dwest@middlebury.edu
Treasurer	David Westerman	(802) 485-2337	westy@norwich.edu

Board of Directors

Les Kanat	(802) 635-1327	les.kanat@jsc.edu
George Springston	(802) 485-2734	gsprings@norwich.edu
Kristen Underwood	(802) 453-3076	southmountain@gmavt.net

Chairs of the Permanent Committees

Advancement of Science	Jon Kim	jon.kim@state.vt.us
Membership	David Westerman	westy@norwich.edu
Public Issues	Laurence Becker	laurence.becker@state.vt.us
Publishing	Marjorie Gale	marjorie.gale@state.vt.us

**Vermont Geological Society
Norwich University, Dept. of Geology
158 Harmon Drive
Northfield, Vermont 05663**

ADDRESS CHANGE?

Please send it to the Treasurer at the above address