

# THE GREEN MOUNTAIN GEOLOGIST



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

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

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## *The Vermont Geological Society's Fall Field Trip*

*October 27<sup>th</sup>, 9:30 AM  
Cavendish Gorge*

*Meeting time and place will be announced (see information below)*

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## **PRESIDENT'S LETTER**

This fall I'll be stepping down as President of the VGS and I'd like to leave you with a couple of parting ideas. This organization has been very effective at promoting the advancement of geology in Vermont and in outreach to the public. To see this, just browse over the last few issues of the Green Mountain Geologist. The list of accomplishments, even in only the last 10 years, is long. The interesting thing about this is that those accomplishments are mostly the result of a very few active participants.

Our organization is, at the moment, limping along with too few members who are willing to participate in organizing activities, giving talks, leading field trips, and putting together the newsletter. This means that some of those who are participating end up have to take on too many tasks. I'm not asking every member to devote vast amounts of time to the Society. That's not what's needed. Instead, we simply need more members who will step up for a season or two and take on the tasks. None of it is hard and much of it is fun and satisfying (at least to people like us who are endlessly curious about the natural world). Indeed, many of you have participated in a most excellent fashion. However, we do need more helpers to take turns at the various tasks.

I'll step down from my present role as soon as we can hold an election and certify the results. I'll be on the Board of Directors and will certainly remain involved in this wonderful volunteer organization.

Sadly, I have to note the untimely death of one of our stalwart members, John Carmola. See the note by Jon Kim elsewhere in this issue. He clearly had a great love for the natural world and a passion for geology. There was no telling where I would run into him. Once I was on a site visit to a large landslide on the Missisquoi, way out back of the farm fields and far from the highway, and who should I see kayaking by but John, grinning from ear to ear. Another time I was leading a Green Mountain Club hike up Burnt Rock Mountain in Fayston and up on the summit ridge there was John (and one or two other members of the informal "Church of the Rock"), crouched down and closely examining the schist with a hand lens. I'll miss his pleasant and active participation in so many meetings and field trips and I extend my deepest sympathies to his family and friends.

Respectfully submitted, George Springston

## **MINUTES of the EXECUTIVE COMMITTEE MEETING**

The Executive Committee met over the summer at UVM.

Issues of the GMG and Vermont Geology are scanned (excluding 1998 and 2004 GMG, soon to come) and can be found at the Vermont Geological Survey website.

There was discussion about the membership of the executive committee and nominations were accepted. It was agreed that we would use Survey Monkey, or similar, for the voting process.

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Marjorie Gale of the Vermont Geological Survey has agreed to be our newest VGS lecturer. The VGS lecturer was set up to provide lectures, at low to no cost, to institutes around the state. Please contact Marjorie at the State Survey if you'd like to invite her. Her talk is titled "The Bedrock Geologic Map of Vermont: Highlights, Transitions and Notes about the Journey."

We would like to get more students interested in joining the Society. Rick Dunn has a flier that he can provide to others to use as a template for advertising the Society.

There was discussion of the winter meeting. It was settled upon that we will invite a speaker, that there may be a theme for other talks, and we will have a potluck meal.

### **TREASURER'S REPORT**

The finances of the Society remain strong, thanks to the generous support from its members. Cash on hand as of September 20 is \$6,288. Despite the late solicitation this year, we have received \$1,400 in dues for 2012, and \$630 in contributions to the Research Grant Program. New research awards will be going out for the fall as students submit proposals for review. It's not too late to pay your dues. (Remember that the Society's policy is to stop sending the GMG after a brief grace period; look for that stamped envelope on the refrigerator). No expenses have been incurred since the last Treasurer's report.

Please join me in welcoming the following new members:

Laurie Grigg, Dept. Geology & Env. Sci., Norwich University  
Francis Tucker, Mt. Abraham Union High/Middle School  
Miles Waite, Waite Environmental Management

Respectfully submitted, David S. Westerman, Treasurer

### **ADVANCEMENT OF SCIENCE COMMITTEE REPORT**

#### Loss of a VGS Member

As I prepared maps for the Vermont Geological Survey summer 2012 field trip approximately a week prior, I thought about the faces I would see at the park and ride in Plainfield, prior to the start of the trip. Over the past few years, one of my favorite groups was "The Church of the Rock", a spirited group of close friends from St. Albans, who had developed a love for geology external to their professional lives, and had recently initiated some field research of their own. This group was comprised of John Carmola, a retired physician, J.D. Thoren, a retired pharmacist, and Paul Madden, a building contractor. Our informal ritual was to gather in a circle and bow to each other as the great outdoors was indeed "The Church", and laugh. I looked forward to the meeting.

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Shockingly, I received a voicemail from J.D. Thoren a couple days later telling me that John Carmola had drowned in a swimming accident in North Carolina. These events are so hard to process because one's mind mourns at its own pace, which often is a number of days behind. I was so grateful that J.D. Thoren and a friend attended the field trip and that we were able to reminisce some about John. I remember that John would often ask difficult questions that I really had to dig deep to answer; they would often start with "Yeah, but how do you know that"? In addition to his family and friends, the Vermont Geological Society will greatly miss John Carmola, particularly his enthusiasm and laugh. We will, however, look forward to seeing brothers J.D. and Paul and hopefully new brothers (and sisters) of "The Church" at all future VGS events.

### Research Grants

Applications for Vermont Geological Society Research Grants must be *postmarked* by October 1<sup>st</sup>, 2012 and sent to:

Jon Kim  
Vermont Geological Survey  
103 South Main Street, Logue Cottage  
Waterbury, VT 05671

See our website for application forms.

### Guest Lecturer Program

Marjorie Gale has agreed to be the Vermont Geological Survey Guest Lecturer for the upcoming year. She is offering a lecture entitled: "The New Bedrock Geologic Map of Vermont: Highlights, Transitions, and Notes about a Journey". Contact Marjorie directly at [marjorie.gale@state.vt.us](mailto:marjorie.gale@state.vt.us) if you would like to arrange a lecture for your institution.

### Summer 2012 Field Trip

On Saturday August 11, 2012, the Vermont Geological Society ran its summer field trip entitled "Rocks, Dirt, and Plants- Integrating Geology and Plant Ecology". The leaders of this trip were: Jon Kim of the Vermont Geological Survey, George Springston of Norwich University, and Eric Sorenson and Everett Marshall of the Heritage Inventory, at the Vermont Dept. of Fish and Wildlife. Nineteen attendees set out from the Plainfield park and ride to look at the following four stops (all photos that follow by Erica Mitchell):

- 1) Low Diversity Forest grown on soils derived from glacial till and the underlying biotite granite of the Middle Devonian Knox Mountain pluton in Marshfield. Because the calcium content of the granite is so low, the plant diversity is low and favors the following: Sugar Maple, Beech and White and Yellow Birch trees.
  - 2) Intermediate Diversity Forest grown on soils derived from glacial till and the underlying interlayered gray phyllites and quartzites of the Early Devonian Gile Mountain Formation in the Marshfield Town Forest. The diversity of trees and plants is intermediate because of calcium contributions from: A) rock fragments of impure marble in glacial till derived from the nearby
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Waits River Formation and B) isolated layers of impure marble that occur in the Gile Mountain Formation. The plant diversity is intermediate and favors the following: Sugar Maple, Beech and Hemlock trees. A few plants that prefer calcium-rich soils were found such as False Melic Grass.

3) High Diversity Forest grown on soils derived from glacial till and the underlying interlayered gray phyllites and impure marbles of the Early Devonian Waits River Formation on Eric Sorenson's land in Calais. The diversity of trees and plants is high because of calcium contributions from: A) rock fragments of impure marble in the glacial B) abundant layers of impure marble (1-30' thickness) that occur in the Waits River Formation. The plant diversity is high and favors the following: Sugar Maple, Basswood, Butternut, and Ash trees. There are a number of calciphile plants present such as Leatherwood, Silvery Glade Fern, and Bulblet Fern.

4) Thick Surficial Deposits on the Winooski River Plant communities that grow in soils derived from Pleistocene clays and sands of Glacial Lake Winooski. This site was ideal for summarizing the successional plant communities that develop in a former pasture. The severe erosion of the high banks of the Winooski River that occurred during severe storms during the last 2 years (May and August of 2011) was also emphasized. Plants such as Goldenrod, Wild Carrot, and Willow shrub were observed.



*View to the east of the Knox  
Mt. Granite Pluton from stop 2.*



*Jon Kim performs the acid test on Waits River Fm. marbles at stop 3.*



*George Springston explains his cross section at stop 3.*



*Eric Sorenson augering into soils at stop 3.*



*Everett Marshall discussing Willow shrubs at stop 4.*



*Marginal  
Woodfern at  
stop 3.*



*Indian Pipes at  
stop 3.*

*Bulblet Fern at  
stop 3. Note  
bulblet at top.*



## VERMONT STATE GEOLOGIST'S REPORT

### Essex Jct, Pico Peak and Northfield Quads

The Vermont Geological Survey (VGS) delivered paper copy maps and digital (GIS) data to the USGS on August 30, thus completing the mapping projects funded through the STATEMAP grant and returning us to an annual mapping schedule. Materials submitted include results from surficial geologic mapping in the Pico Peak quadrangle and bedrock mapping in the Essex Junction quadrangle. Digital data for legacy bedrock maps from the Champlain Valley and for the surficial geology of the Northfield quadrangle were also delivered. All maps and data are

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posted on the VGS web site and also accessed from the National Geologic Map Database (NGMDB) web site. Stephen Wright from the University of Vermont mapped the Pico Peak area. Marjorie Gale and Abigail Ruksznis of the VGS completed digitization and digital cartography. Abigail Ruksznis and George Springston of Norwich University digitized the legacy Northfield map. The Essex Junction bedrock mapping project (M. Gale, J. Kim and A. Ruksznis of the Division) included digitization of the bedrock legacy data and completes a significant portion of northwest Vermont at a scale of 1:24,000. During the past decade, digital geologic maps have become the standard and most geologic analyses rely on digital data. Requests from the public and the consulting industry for digital data in northwestern Vermont highlighted the need to produce digital maps at 1:24,000 from the legacy map projects. The VGS continues to develop groundwater resource maps using the framework geologic map data.

#### Paper Accepted for Publication by Geological Society of America

The VT State Geologist is the lead with the State Geologists of Maine, Massachusetts, Connecticut, and the Northeastern States Emergency Consortium (NESEC) Executive Director on a volume chapter to be published by the Geological Society of America in Denver, Colorado. The paper (chapter) accepted on June 20, 2012 is entitled: *“Seismic Hazard Assessment in New England through the use of Surficial Geologic Maps and Expert Analysis”* in volume: *“Recent Advances in North American Paleoseismology and Neotectonics East of the Rockies”*. These coauthors also delivered to USGS on Sept 1, 2011 entitled: *Utilizing the Surficial Geology of the Northeast United States to Improve NEHRP Site Effect Classifications in HAZUS-MH: Collaborative Research with NESEC and the NESEC State Geologists.*

#### Act 163 – Testing of Potable Water Supplies

Jon Kim of the VGS in cooperation with Pete Ryan of Middlebury College have worked diligently for science informing public policy through very careful collection and application of data, and knowledge transfer. The work of the VGS and Middlebury was invaluable in leading to the passage of Act 163. The legislature has been wrestling with the best way to address this Health issue. S.77 passed in 2011; however, the Governor was concerned with some aspects of the bill. S.183 passed the legislature with modification in 2012 and the Governor signed on May 17, 2012. The Health Department has primary responsibility but the VGS is to receive testing data from State Certified Labs. The intent is to use the data to develop mapping and a clearinghouse identifying groundwater contamination locations for such constituents of concern as radionuclides and arsenic. Geology has been and continues to be involved in this effort and is integrating data coming in from multiple sources.

#### Energy – Geothermal

On July 24, Jon Kim in cooperation with Plattsburgh State University in NY began the well testing program associated with the VGS geothermal grant from DOE. Professor Edwin A. Romanowicz ran a testing rig known as a Mount Sopris unit taking water temperature data and performing other logging functions on a 1000 foot well at the Champlain College campus in Burlington. The well does not yet have a pump installed for geothermal use and the College approved the testing regime. A second well was tested at Champlain College and a third well at the Spafford well drilling company in Jericho. All now have bottom hole temperature data to apply to the study that hopes to uncover the nature of temperatures in deeper wells to better understand the potential for geothermal resources in VT.



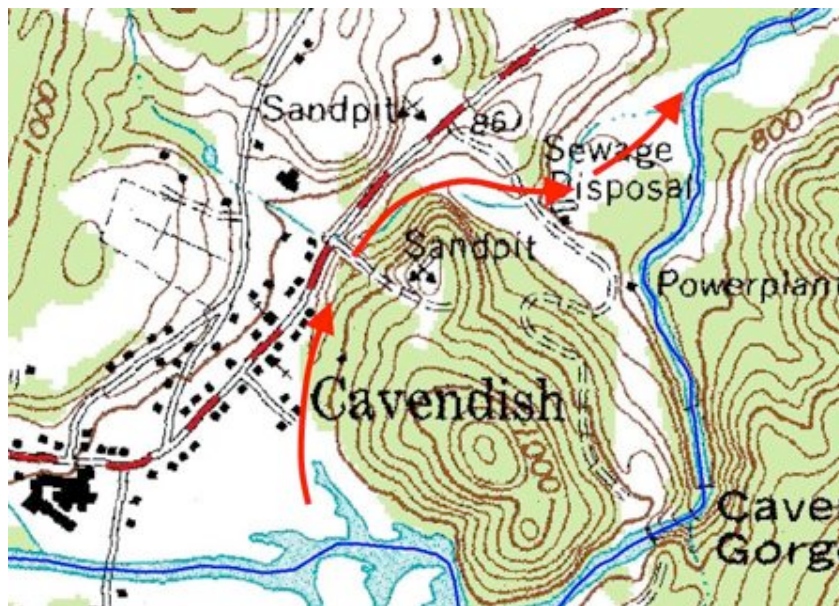
## ANNOUNCEMENTS

**Fall 2012 VGS field trip**  
***History of Flooding at the Cavendish Gorge***  
Saturday, October 27, 2012 - 9:30 AM to Noon

Kristen Underwood has organized a trip to the Cavendish Gorge hydro facility located on the Black River in Cavendish, Vermont. The impoundment and hydroelectric station are managed by Green Mountain Power (previously Central Vermont Public Service). A guided tour of the hydro station will be offered along with a discussion of the history of the dam and associated mill buildings.

During the historic flood of record in 1927, floodwaters bypassed the gorge and carved a wide and deep gully along Rt 131. Several homes were washed downstream. During Tropical Storm Irene, floodwaters again occupied this gully and washed out the road. Pictures and maps of historic floods will be reviewed, and more recent impacts from Irene will be summarized. Following the facility tour, we will examine the extensive flood deposits within the avulsion channel and downstream along the Black River channel. George Springston will also be on hand to contribute to the discussion of the surficial geology.

**Please RSVP** to Kristen Underwood at [southmountain@gmavt.net](mailto:southmountain@gmavt.net) if you will be attending the field trip. Parking is somewhat limited at the hydro station; depending on the number of interested persons, we may assemble at a nearby location (to be announced) and carpool to the hydro station. Stay tuned for a future email providing directions.



*Approximate path of channel avulsion on the Black River main stem during the 1927 flood, Cavendish, VT.*

**ANNOUNCEMENTS****VT ASCE SECTION MEETING  
VT GEO-INSTITUTE CHAPTER MEETING**

WHERE: MILANO BALLROOM NORWICH  
UNIVERSITY, NORTHFIELD, VT WHEN:  
October 10, 2012  
Bar opens at 5:45 PM - Dinner at 6:30 PM

**SPEAKER: JOHN KASTRINOS**  
Lead Hydrogeologist  
Haley & Aldrich, Inc, Manchester, NH

**Geothermal Heating and Cooling**

John Kastrinos ASCE Haley & Aldrich, Inc.  
340 Granite Street, 3<sup>rd</sup> Floor Manchester, NH. 03012 (603) 361-0397

The presentation will describe the use of geothermal heating and cooling (also known as ground-source heat pumps) to save energy and reduce the use of fossil fuels and production of greenhouse gases in commercial and institutional buildings, which consume a tremendous amount of energy. Geothermal systems are playing an important part in producing new energy-efficient buildings, and improving the efficiency of existing buildings, including government buildings that are being rehabilitated through "energy conservation upgrades" that help to promote green energy. Mr. Kastrinos will provide an overview of the basics of the technology, financial analysis, design parameters and some potential pitfalls citing some specific case studies he has been involved with in New England.

**\$35 per person/\$20 within 5 years of graduation/\$10 per student**  
**ASCE Life Members are Free (no shows will be billed)**

**1 PDH credit earned for attendance**  
**Send Reservations by October 2 to John Stevens at**  
**[stevens@norwich.edu](mailto:stevens@norwich.edu)**

Dinner will be barbecue chicken, beef brisket, and portabella mushroom with salad, barbecue beans, and cornbread with peach cobbler and apple crisp. There will be a wine and beer bar.  
Come Hungry!

## EXECUTIVE COMMITTEE BALLOT

Please take a moment to vote in the Society's election of Executive Committee members. Very soon you will receive an email from the Vice President, Keith Klepeis, requesting that you complete an online ballot at Survey Monkey. The current slate of members can be found on the following page. If you are unable to use the online option, please fill out the ballot below and mail it to Rick Dunn (Dept. of Geology, Norwich Univ., Northfield, VT 05663).

### BALLOT One vote per position

#### President

Jon Kim \_\_\_\_\_

Other member (write in) \_\_\_\_\_

#### Vice President

Keith Klepeis \_\_\_\_\_

Other member (write in) \_\_\_\_\_

#### Secretary

Dave West \_\_\_\_\_

Other member (write in) \_\_\_\_\_

#### Treasurer

Dave Westerman \_\_\_\_\_

Other member (write in) \_\_\_\_\_

Board Member (G. Springston will move to the Board as past President, per the *by laws*, joining Les Kanat)

Kristen Underwood \_\_\_\_\_

Other member (write in) \_\_\_\_\_

#### Chair of Publications Committee

Marjorie Gale \_\_\_\_\_

Other member (write in) \_\_\_\_\_

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## VERMONT GEOLOGICAL SOCIETY CALENDAR

- October 1: Student Research Grant Program applications due, to Jon Kim. Please see the website for format information. All applications must be postmarked by October 1, to: Jon Kim, Vermont Geological Survey, 103 South Main Street, Logue Cottage, Waterbury, Vermont 05671-2420  
Jon can be reached at the phone and email listed below.
- October 27: VGS Fall Field Trip, led by Kristen Underwood. Please see information in the Announcements, and please RSVP Kristen as soon as possible.

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	George Springston	(802) 485-2734	gsprings@norwich.edu
Vice President	Keith Klepeis	(802) 656-0247	kklepeis@uvm.edu
Secretary	David West	(802) 443-3476	dwest@middlebury.edu
Treasurer	David Westerman	(802) 485-2337	westy@norwich.edu

### Board of Directors

Richard Dunn	(802) 485-2304	rdunn@norwich.edu
Les Kanat	(802) 635-1327	les.kanat@jsc.edu
Jon Kim	(802) 241-3469	jon.kim@state.vt.us

### Chairs of the Permanent Committees

Advancement of Science	Jon Kim
Geological Education	Christine Massey
Membership	David Westerman
Public Issues	Laurence Becker
Publishing	Richard Dunn

**Vermont Geological Society  
Department of Geology and Environmental Science  
Norwich University  
Northfield, VT 05663**

***ADDRESS CHANGE?***

*Please send it to the Treasurer at the above address*

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Fall Field Trip  
October 27, 2012, 9:30 AM  
Cavendish Gorge, VT  
Please RSVP Kristen Underwood ([southmountain@gmavt.net](mailto:southmountain@gmavt.net))  
Further directions will arrive via email**