



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

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

**WINTER 2015**

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**PRESIDENT'S LETTER**

One of the most memorable photos I have taken while working for the Vermont Geological Survey is above, which shows the Jeffersonville landslide scar after the second of two landslides in 1999. A house was perched precariously at the edge of a cliff above the Brewster River and fresh trees were still collapsing into the scar. The cliff is composed of Pleistocene glaciolacustrine deposits with light brown fine sands overlying gray varved clays. Larry Becker is the bottom right of the photo looking over the damage. As the Vermont Geological Survey prepares to celebrate Larry's retirement on January 24, 2015, we should pause to remember the path that he led the Vermont Geological Survey on over the past 20 years. Our mission has been to use intensive field-based geologic studies to build a detailed framework ("The Vessel" as he would say) for understanding and mitigating geologic hazards. In the traditional sense, "hazards" are thought of as physical, including only landslides, erosion, floods, and earthquakes. However, we have also worked extensively on geochemical hazards to human health, such as radionuclides, arsenic, and nitrates in groundwater. Our group (below) had a really good run under Larry.



From right to left, Larry Becker, Jon Kim, Marjie Gale, and George Springston, on a 2014 visit to the Lowell Wind Farm.

Respectfully submitted,  
Jon Kim, President

**MESSAGE FROM LAURENCE BECKER, VERMONT STATE GEOLOGIST,  
1995-2014**

An Honor to Have Served

It has been an honor to serve you as the Vermont State Geologist from 1995 -2014 and a privilege to direct the Vermont Geological Survey (VGS). The geological community is a strong one in Vermont and the VGS is an integral part of that community. We have accomplished much during the last 20 years through the work of the Survey and the work of all your respective organizations as individuals while often collaborating together. The line of State Geologists goes back to 1845 but the job continues to be reinvented with every new generation. I came in at the beginning of the digital mapping revolution and we have played this technology to the benefit of all. At our web site are multiple maps products – framework geology and a range of applied maps based on GIS technology. Today GIS is the everyday means to make maps, but not in 1995. Not only have we produced VGS products, but in cooperation with USGS partners, most notably Nick Ratcliffe, Greg Walsh, and the technical and cartographic teams, we produced the 2011 Bedrock Geologic Map of Vermont.

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The partnerships have also been with the academic institutions in the State – the University of Vermont, Middlebury College, Norwich University, Johnson State and Castleton – their professors and students. The University of Vermont is our primary academic partner on the 2011 Bedrock Geologic Map of Vermont (Rolfe Stanley, Char Mehrrens, Barry Doolan). In recent years, UVM has provided structural geologic studies from Keith Klepeis and geophysics from Laura Webb. For geology and public health, Middlebury College and Pete Ryan, have been our primary partners. Ray Coish and his multiple geochemical studies contribute in a number of areas. The long standing partnership with Norwich gave us George Springston's work on surficial mapping and landslide considerations. Thanks to Dave Westerman for all his support. Helen Mango at Castleton and her work on arsenic and Leslie Kanat at Johnson State and his work on the Jeffersonville landslide brought cooperation with the State Colleges. Thanks to Peter Thompson and Thelma Thompson for their work on the bedrock map. Thanks to surficial mappers Stephen Wright from UVM and John Van Hoesen from Green Mountain College, and Rick Dunn, Norwich. John Lens and Mandar Dewoolkar of UVM engineering contributed seismic hazard maps in cooperation with George Springston. Thanks to Anne Clift for her work on a landslide mapping protocol. Numerous interns have made fine contributions. If I have missed any one please forgive, you all have done special work.

#### Special Thanks to the VGS Core

Please welcome *Marjorie Gale* as our next State Geologist. Marjorie received an MS in Geology from UVM and her thesis was about the bedrock and tectonic history of rocks at Belvidere Mountain. Marjorie started her career for the State in 1996 and is a co-author of the 2011 Bedrock Geologic Map of Vermont. She currently is working on mapping, till chemistry and groundwater projects.

Our next State Geologist is highly deserving of the honor. She has worked diligently to provide geologic information to the community in the form of her mapping and co-authorship of the 2011 Bedrock Geologic Map of Vermont. Her web site work delivers the geologic goods to our audience in fine style. At the web site are the maps and the groundwater studies she completed and much more. Recent Till studies which are underway are a new area for her science.

Our work together goes back to 1996 at the beginning of my tenure. We have worked together for many years and spent many hours of discussion to design and build programs and

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working the grants that pay for them. I will very much miss our direct interactions. At every stage, Marjorie has shown much ability and willingness to plan and execute tasks. What stands out is the competence and quality of product that always results with the speed and agility to bring the work in on time. I could not have done the survey's work without her and if people think of our work kindly looking in from the outside, a key part is due to Marjorie's perseverance, science, and organization.

*Jon Kim* is our State's expert on Geology and Health, from work that began with an elevated radionuclide reading in a well in Colchester progressing to studies in Williston, Hinesburg and Bristol and other localities around the State. Arsenic studies with Middlebury College followed and all were intended to reveal information about the potential health hazard. The work led to passage of a bill to provide notification to homeowners to test for constituents of concern.

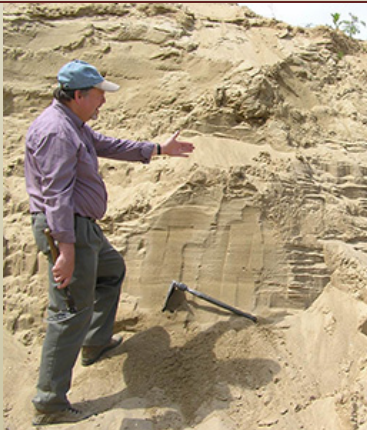
Before Jon joined us in Vermont he proposed a mapping project with an Adobe figure he built to illustrate the plan. He was ahead of his time in 1995 helping me see a visual presentation future for VGS when few knew how to use this tool. How successfully he has played this out. All the fine and very defensible science he has built from mapping projects, geochemistry, water samples, water well data, and geophysics always lands in a final product with visual panache. It tells the story and is key to having Vermonters respect our work and look to us for science. His publication record in peer reviewed journals is a very active one. He works closely with towns when a mapping project is underway. He has talent for collaboration with others and with the students to bring forward a strong and respected body of work in a legacy for Vermont.

*George Springston* of Norwich University has been integral to many projects here at the VGS for 15 years and made our partnership work so effectively over the years. The body of work he has brought us resides in the surficial mapping projects, landslide work, hydrogeologic coding and single year projects such as the highway study. All are outstanding benefiting from his methodical and careful approach. Because of that care we can always count on the results of the reports to be very well written and focused directed toward the essentials. His legacy is a very careful body of work very well considered and toward the applied. He has been a great support to the survey. He has a style that includes ideas presented and makes a fellow geologist really feel like a partner throughout any project.

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Winter GMG bragging rights for 'Where's It, What's It?' go to Bruce Cox who identified the site as Rte. 106 in Weathersfield. "The location is on VT Route 106 just south of the intersection of VT Routes 106 and 131. The view is to the south. The stream is the Black River. The shot was taken in the aftermath of Tropical Storm Irene. This area was reported to be the last section of state highway to reopen."



Larry Becker, Vermont State Geologist, 1995-2014

Thank you all for your support and guidance. I have many fond memories of the field and the Northeast GSA meetings and all our interactions. It has been a great run and thank you for the opportunity.

Respectfully submitted,

Laurence Becker

### STATE GEOLOGIST'S REPORT

The first order of business is to relay to you a brief history of Larry Becker's accomplishments over the past 20 years as State Geologist and celebrate his contributions. Larry began working at the State of Vermont in 1981 and has served since 1995 as the 13th State Geologist, the first being Charles Adams in 1845. For the past 20 years Larry has directed the activities of the Geology Division and Vermont's Radioactive Waste Management program. Prior to 1995 he served as Technical Services Chief for the VGS and as a groundwater planner for DEC. He developed the aquifer mapping protocols for Vermont's aquifer protection program and has managed the mapping programs, stream geomorphology studies, and advised the legislature on mineral industry issues and groundwater.

Larry served on numerous committees including: Chair of Education Committee, Association of American State Geologists; Chair, NESEC State Geologists - Northeastern States Emergency Consortium (NESEC); Vermont State Hazard Mitigation Committee; VT State Nuclear Advisory Panel; and the Groundwater Coordinating Committee.

Larry worked hard to connect the Survey and geology to other government Divisions, Departments and Agencies and made a constant and creative effort to apply geology to address issues in Vermont. He has excelled as a mediator of issues and advocate for science. His management style created a great workplace for all of us.

As I begin my new role at the Vermont Geological Survey, I want to express my appreciation to the geologic community and my co-

workers for their encouragement and to Larry, for his leadership, friendship and unwavering commitment to the bedrock map of Vermont and to the Vermont Geological Survey.

Respectfully submitted,

Marjorie Gale, Vermont State Geologist

### **WINTER MEETING, JANUARY 24**

The Vermont Geological Society will hold its annual winter meeting on Saturday January 24, 2015 at the Cider House Restaurant on Route 2 in Waterbury. This meeting will commemorate the retirement of Larry Becker, who was the Vermont State Geologist for the past 20 years. The program for this event is shown below:

4:00 – 5:00 PM: Beverages (cash bar and soft drinks) and Appetizers (chicken wings, spinach dip, and cheese and crackers).

5:00 – 6:00 PM: Buffet Dinner (\$20 per person will be collected at the door)

Entrees: Pulled Pork, St Louis Ribs, Grilled Chicken, Vegetarian Pasta Primavera

Side Dishes: Mac and Cheese, Black Beans and Rice, Green Beans

Desserts: Warm Apple Crisp and Maple Bread Pudding

6:00 – 7:30 PM: Guest Speakers on Applied Geology

Bob Marvinney (Maine State Geologist), “Arsenic in Maine groundwater and attitudes toward testing and remediation”.

Rick Chormann (New Hampshire State Geologist), “Changing Course: The Suncook River Avulsion and its Aftermath”.

Steve Mabee (Massachusetts State Geologist), "Massachusetts Enters the Shale Gas Wars: Facts vs Fiction"

Larry Becker (Vermont State Geologist Emeritus), to be announced.

I received 43 RSVPs by December 31, 2014. The *last possible day* to reserve a space at this meeting is Thursday January 15th, 2015 (Jon Kim: geojon710@msn.com).

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## ADVANCEMENT OF SCIENCE COMMITTEE REPORT

There were two proposals submitted to the Vermont Geological Society Research Program and both received full funding. Please see the Treasurer's Report for details.

Respectfully submitted,  
Jon Kim, Chair

## TREASURER'S REPORT

**Finances:** The Society remains in good financial health. Since the last report we have awarded two research grants and covered Executive Committee meeting expenses, and no new income has been received.

**Expenses:**

- \$700 Nick Bachman, Middlebury College, "Uranium Bearing Phosphorite Breccia in the Clarendon Springs Formation Dolostone and the Implication for Aquifer Chemistry; Milton and Colchester, Vermont"
- \$700 Cynthia Connard, Middlebury College, "U-Pb Dating of Detrital Zircons in the Cram Hill Formation, Vermont: Implications for Paleozoic Paleogeography and Orogenesis"
- \$114 November Executive Committee meeting expenses

**Balance:** Our balance as of December 31, 2014 is \$10,158 as we await the new year.

**New Members:** None.

Respectfully submitted,  
David S. Westerman, Treasurer

## CALENDAR

**Middlebury College, Geology Seminar Series**

**Date:** February 27, 2015

**Time:** 12:30 pm

**Location:** Room 417, Bicentennial Hall, Middlebury College, Middlebury, VT

**Information:** Ryan McKeon of CalTech will present "Shouldn't the Appalachians be flatter by now? New perspectives on an old mountain range from low-temperature thermochronology"

**Middlebury College, Geology Seminar Series**

**Date:** March 13, 2015

**Time:** 12:30 pm

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**Location:** Room 417, Bicentennial Hall, Middlebury College, Middlebury, VT

**Information:** Andrew Schroth of UVM will present a talk about the influence of glaciation on iron in fluvial and marine systems. Title TBA.

**2015 Northeastern Section Geological Society of America 50th Annual Meeting**

**Date:** March 23-25, 2015

**Location:** Bretton Woods, Mount Washington, New Hampshire

**Information:** For information, visit the web site or contact [Brian Fowler](#) (meeting chairperson) or [Gary Johnson](#) (chair, Tech Program).

**Middlebury College, Geology Seminar Series**

**Date:** April 24, 2015

**Time:** 12:30 pm

**Location:** Room 417, Bicentennial Hall, Middlebury College, Middlebury, VT

**Information:** Rich Goldfarb of USGS will present a talk about tectonics and ore deposits. Title TBA.

**2015 NGWA Conference on Groundwater in Fractured Rock**

**Date:** September 28-29, 2015

**Location:** Burlington, Vermont

**2015 Geological Society of America Annual Meeting & Exposition**

**Date:** November 1-4, 2015

**Location:** Baltimore, Maryland

**2016 Geological Society of America Annual Meeting & Exposition**

**Date:** September 25-28, 2016

**Location:** Denver, Colorado

**Host:** Geological Society of America

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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) 656-0247	keith.klepeis@uvm.edu
Secretary	Will Amidon	(802) 443-5988	wamidon@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
Publications	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*