

# THE GREEN MOUNTAIN GEOLOGIST



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

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

WINTER 2011

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*Announcing  
The Vermont Geological Society's  
Spring Meeting*

*April 23, 2011, 9:00 AM  
Delehanty Hall, Room 219  
University of Vermont, Burlington, Vermont*

*Keynote Speaker Dr. Robert DeConto*

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## **PRESIDENT'S LETTER**

We're a bit late with the winter newsletter, but have no fear, the Vermont Geological Society is alive and well. As you'll see in the rest of this newsletter, we have some great events coming up, including a combined winter/spring meeting in April and a summer field trip to the Connecticut River valley. We're looking into having this trip be in collaboration with the New Hampshire Geological Society.

We are in a transition time here at the Society, with Dave Westerman taking over as Treasurer and Rick Dunn as our new Publications Chair. Steve Howe is stepping down from these posts after many years of service. I'd like to extend warm thanks to Steve for all his work and we hope he will continue to stay connected with the Society even as he focuses more on the newest member of his family.

I want to thank Kristen Underwood and all of you who came to the special meeting in January regarding the future of the Vermont Geological Survey. See the State Geologist's Report for the latest on how this has worked out. Your support is much appreciated.

I was somewhat surprised to discover while reading the documents prepared for the special meeting that the Society had many years earlier played a role in helping the Vermont Geological Survey through a difficult time when its location was transferred from UVM to the Agency of Natural Resources. Perhaps it's time for someone to prepare a brief history of the Society so that us relative newcomers can understand how we got where we are today. Any volunteers?

Finally, keep your calendar open this fall: The New England Intercollegiate Geologic Conference will be hosted by Middlebury College and will doubtless feature an exciting array of trips.

I hope to see you all out there on the rocks!

Respectfully submitted,  
George Springston, President



*VGS summer trip, '09, on the trail in Smugglers Notch (courtesy R. Dunn)*

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## **ANNUAL MEETING MINUTES & ELECTION RESULTS**

The Vermont Geological Society did not hold an Annual Meeting during the fall of 2010, nor did the Executive Committee meet. Instead, the members of the Committee communicated with one another on several occasions by e-mail to discuss a number of issues and to plan the upcoming Spring 2011 Meeting. The Winter Meeting is not being held this year.

In the fall, nominations for Society officers were solicited and then voted upon. The following officers were elected for the 2010-2011 year:

President	George Springston
Vice-President	Keith Klepeis
Secretary	David West
Treasurer	David Westerman
Board of Directors	Richard Dunn, Les Kanat, Jon Kim
Chair, Membership Comm.	David Westerman
Chair, Publishing Comm.	Richard Dunn

### **TREASURER'S REPORT**

As I take over the responsibilities of Treasurer, I find the Society to be in excellent financial health. We started 2011 with a balance in the bank of \$6,182.28, and have since paid out \$2,998.60 for three research grants to students at local colleges and universities. To my knowledge the Society has no outstanding bills at this time.

The 2011 membership renewal and directory information form was mailed to all members by Stephen Howe near the close of last year. Since then, dues and contributions to the Research Grant Program have steadily been coming in, and a total of \$2,390 has been deposited thus far. If you have not yet renewed your membership, please do so soon. This will help keep Society expenses to a minimum by avoiding having me track you down and pester you. Also, please consider making an additional tax-deductible contribution to the Research Grant program. The projects that we fund keep pushing our understanding of Vermont geology forward.

Finally, please join me in forwarding a heartfelt thanks to Stephen Howe who has just stepped down after a solid stint as Treasurer. He left the affairs of the Society extremely well organized, making my entry into this position very smooth. It will be a tough act to follow.

Respectfully submitted,  
David S. Westerman, Treasurer

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## **ADVANCEMENT OF SCIENCE COMMITTEE REPORT**

The Advancement of Science Committee (ASC) received the following three proposals by the October 1, 2010 deadline and, after review, decided to fund all in full. The names of the recipients, the research titles, and the monetary awards are:

- 1) Maggie McMillan, University of Vermont undergraduate, "A Structural Analysis across Craftsbury, Vermont", \$698.60.
- 2) Alison Thompson, Middlebury College undergraduate, "Geochemical and Sulfur Isotope Analysis of Taconic Slates: Implications for Arsenic Source and Mobility in a Bedrock Aquifer System", \$700.
- 3) Erik Brooks, Middlebury College undergraduate, "Geochemical Analysis of Groundwater and Bedrock in Craftsbury, Vermont: Assessment of Potential for Radionuclide Contamination of a Fractured Bedrock Aquifer System", \$700.

After conferring with other members of the Executive Committee, the ASC looked into the possibility of having a keynote speaker at the Vermont Geological Society student meeting on Saturday April 23, 2011 at the University of Vermont Geology Department. Dr. Robert DeConto of the University of Massachusetts/Amherst, who studies the Cenozoic glaciation of Antarctica and its relationship to atmospheric CO<sub>2</sub>, has accepted our invitation to speak. A tentative schedule has been proposed that will have Robert give his talk from 11 -11:50 AM, between two series of student talks. A potluck lunch will be served after Robert's talk, but before the second series of student talks.

In addition, we are investigating the possibility of having a joint summer 2011 field trip with the New Hampshire Geological Society.

Respectfully Submitted,  
Jon Kim

## **VERMONT STATE GEOLOGIST'S REPORT**

### **Governor's Proposed Budget**

On January 25, 2011, the budget narrative for the Vermont Department of Environmental Conservation (DEC) contained good news. Though the budget does not pass until May 2011 and federal money remains in question, the words bring needed stability to the Vermont Geological Survey (VGS) and our ability to serve the geological community.

"A proposal to transfer the Division of Geology (Vermont Geological Survey) to the University of Vermont did not ultimately occur as planned in SFY '11 so the SFY '12 budget reflects an increase in costs to return the Division of Geology fully to the DEC budget."

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The VGS very much appreciates all the voices at the January 5, 2011 meeting and Kristen Underwood's leadership in support of our fiscal health and long-term viability. Kristen continues to make contact with policy makers to support the critical functions that the VGS provides. (Please see a meeting report in these pages)

### **Private Well Testing**

Senator Virginia Lyons held a session of the Senate Natural Resources and Energy Committee on Feb 9 to hear about a Middlebury College environmental seminar study of "Arsenic Contamination in Vermont's Private Wells". The Vermont Geological Survey cooperated with Middlebury on the geology and spatial data presentation of groundwater quality results. Senator Lyon is planning to submit a bill that includes testing of private wells and new wells as a condition of contract for sale. Arsenic, lead, uranium, gross alpha radiation and coliform bacteria are to be considered. The State Toxicologist was in attendance and asked that manganese and fluoride also be considered as additional naturally-occurring contaminants of concern.

### **Vermont Yankee – Tritium Release**

The State Geologist is part of the hydrogeologic review team assessing results of the study on the tritium release from the Entergy Vermont Yankee Nuclear Power Plant. There are over 25 monitoring wells installed and Lake Hitchcock sediments are encountered in a number of these wells. An interesting aspect is that static water levels in some of the monitoring wells in both the deep and shallow overburden material, and in an unused bedrock well, show fluctuations related to changing elevations in the pool behind the Vernon Dam on the Connecticut River.

### **Town Groundwater Mapping**

On January 24<sup>th</sup>, Jon Kim of the Vermont Geological Survey (VGS) and George Springston of Norwich University met with the Craftsbury Conservation Commission (CCC) to present new bedrock and surficial geologic maps. These maps will be integrated with water well logs and other data to evaluate the groundwater resources of Craftsbury. A collaborative study with Prof. Pete Ryan of the Middlebury College Geology Dept. will complement the final product with testing data from selected wells for a suite of metals and non-metals (radioactivity, arsenic, uranium, hardness, iron, chloride etc.).

## **UPDATE FROM CHAIR OF STATEMAP GEOLOGIC ADVISORY COMMITTEE**

The recent economic climate and a significant projected shortfall in Vermont's General Fund budget for the coming fiscal year, have led to concern over future funding of the Vermont Geological Survey. General Fund allocations to the Survey are critical for leveraging STATEMAP funds to carry out ongoing quad-based bedrock and surficial mapping around the state, as well as leveraging other federal funds (e.g., FEMA dollars which are enabling a landslide hazard mitigation protocol) and a variety of grant sources. At this time, the Vermont Geological Survey is funded in the FY2012 budget (July 1, 2011 – June 30, 2012). Still, there is

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some uncertainty regarding federal sources of revenue to the Dept of Environmental Conservation (DEC) budget (where funding for the Survey resides). Traditionally, federally-sourced funds (FEMA, EPA) comprise a significant portion of the DEC operating budget. If shortfalls result in these federally-sourced funds, this could have an impact on the bottom-line of the General Fund portion allocated to DEC (and the Survey).

An ad hoc committee of geologists was convened on 5 Jan 2011 at Norwich University to share perspectives and brainstorm potential support strategies to ensure that the role of the Survey is better understood within Governor Shumlin's new Administration and among the broader community, and that the Survey is adequately funded to continue its important work.

Twenty-three people attended the meeting; most were Vermont Geological Society members. The ad hoc nature of assembly was due to the fact that three members of the Vermont Geological Society Executive Committee are directly or indirectly employed by the Survey. It was the opinion of the overwhelming majority of those in attendance, that recommendations of this group should formally represent the position of the Vermont Geological Society as an organization, and that Executive Committee members with employment connections to the Survey could recuse themselves from any decision-making or advocacy roles in support of the Survey.

Larry Becker, State Geologist, presented the group with a summary of recent events concerning status of the Survey. In the previous fiscal year, a cost-saving measure promoted by former Dept of Environmental Conservation (DEC) Commissioner Justin Johnson, involved moving the Survey to the University of Vermont, thus eliminating approximately \$250,000 allocated to the Survey under the DEC portion of the General Fund. However, negotiations between the Administration and the University of Vermont were unsuccessful and the Survey was not transferred to UVM. Money was cobbled together to sustain the Survey through the end of the present fiscal year, through a one-time appropriation and some unanticipated savings. By early December of 2010, [then] Commissioner Justin Johnson confirmed that the allocation to the Survey under the DEC portion of the General Fund had been restored to the FY 2012 budget.

Justin Johnson has now been appointed Deputy Commissioner under DEC Commissioner David Mears. Governor Shumlin's proposed FY2012 budget – released on January 25, 2011 - reflects that funding has been fully restored to the Survey under the DEC budget.

Several action items were identified by the Ad Hoc committee at the January 6 meeting. A briefing document has been prepared by a subcommittee comprised of Char Mehtens, Craig Heindel, and Dave Westerman, and will be distributed to VT Geological Society members shortly. This document can be used by members and supporters so that we are all working from the same baseline information when we conduct outreach in support of the Survey to the new Administration, legislators, municipal leaders, colleagues, and stakeholders.

Letters of support for the Survey have been delivered to the Administration from the Connecticut State Geologist and requested from EPA Region 1, USGS, and USGS-NCGMP-STATEMAP - to inform the new Administration of important collaborations and the fundamental need for services supplied by the Survey.

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Kristen Underwood is working to schedule a meeting with the DEC Commissioner (David Mears) for STATEMAP Chair (KU) and the Vermont Geological Society (represented by Steve Revell, Craig Heindel, and Dave Westerman).

Over the next couple of months, progress of budget proceedings will be monitored for any actions that may impact the General Fund allocation to the VT Geological Survey. If needed, documentation and additional letters of support will be compiled for testimony to House committees (Appropriations; Fish, Wildlife and Water Resources; Natural Resources) and Senate committees (Appropriations; Natural Resources and Energy) advocating on behalf of the Survey.

Meanwhile, Vermont Geological Society members and colleagues can continue with outreach and education to raise the awareness of the Survey and its fundamental role in a wide variety of applications. Enclosed are some talking points that may be of help.

Please contact me if you would like to offer assistance or be added to an email list to receive updates on efforts to build support for the Vermont Geological Survey.

Respectfully submitted,  
Kristen L. Underwood, PG  
[southmountain@gmavt.net](mailto:southmountain@gmavt.net)  
802-453-3076

- **Vermont Geological Survey's Role:** Demand for accurate geologic mapping and earth science information, from both the public and private sectors, is growing due to increased interest in topics for which the VGS is the major provider of detailed data, such as: geothermal energy; carbon sequestration; groundwater, and the competing uses for its limited availability; surface water; nutrient management; smart growth; sustainable agriculture and forestry; hazard mitigation; and climate change.
  - **Importance of Up-to-Date Geologic Information:** The health and economic welfare of Vermont's citizens is enhanced by the detailed and updated earth science information that is uniquely provided by the VGS. Two-thirds of the towns across the state lack current and updated geologic maps suitable for informed decision-making. With STATEMAP grant funding leveraged by its operating budget, the Survey provides current geologic maps and basic earth science research and information to all Vermont citizens.
  - **Avoidance of Significant Future Public and Private Costs:** VGS's information is fundamental for state and local governments, and all of Vermont's citizens, to avoid future damages from natural hazards, including landslides, streambank erosion, earthquakes, and floods – and to thus to avoid the costly responses to those hazards.
  - **Management of Public Health Risks:** Up-to-date geologic data provides the underlying context that is critical for detailed site-specific investigations and remediation of contaminated sites, and for the management of naturally-occurring toxins that impact public health (e.g., arsenic and radionuclides in drinking water; radon gas in buildings).
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- **Economic Growth and Energy Independence:** Information from the Survey plays a critical role in Vermont's growing and diversified green energy business sector, energy independence and security, and appropriate responses to climate change.
- **Planning Tools:** Geologic data informs town and regional planning strategies, and provides a solid basis for the sustainable use of Vermont's limited groundwater, aggregate and mineral resources.

## CALL FOR STUDENT ABSTRACTS

### SPRING MEETING OF THE VERMONT GEOLOGICAL SOCIETY

The Vermont Geological Society will hold its Spring 2011 meeting on Saturday, April 23, 2011, Room 219, Delehanty Hall on the Trinity Campus of 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 the 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. We hope to have an example of last year's judging form on the Society's website shortly.

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 strongly encourage speakers to send their abstracts electronically as a Word file with a .doc extension attached to an e-mail message to Rick Dunn at [rdunn@norwich.edu](mailto:rdunn@norwich.edu)

If electronic submission is not possible, please mail your abstract well in advance of the deadline to:

Rick Dunn  
Norwich University  
Dept. of Geology and Environmental Science  
158 Harmon Dr.  
Northfield, VT 05663

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 1, 2011 at noon**



## **ANNOUNCEMENTS**

### **STUDENT RESEARCH GRANT APPLICATIONS DUE APRIL 1, 2011**

Applications for Vermont Geological Society Grants should be sent to Jon Kim, Vermont Geological Survey, 103 South Main Street, Logue Cottage, Waterbury, VT 05671 by April 1st 2011. Please read all the requirements on line before submitting an application. For those without internet access, applications can be obtained through Jon Kim at the same address.

### **SUMMER FIELD TRIP**

The Society is considering a joint Summer Field Trip with the New Hampshire Geological Society. Watch your email and the next edition of this newsletter for more information. Please feel free to contact any member of the Executive Committee with field trip ideas, for this summer and beyond.

### **SPRING MEETING KEYNOTE ADDRESS**

by

**Dr. Robert DeConto**

**Associate Professor of Geosciences, UMass-Amherst**

Robert ("Rob") DeConto has been examining the physical and chemical coupling processes between individual climate system components, in an interdisciplinary "Earth system" approach to understanding global climate dynamics, and mechanisms of past, present, and future climatic change. Rob has been working with Dr. Dave Pollard (Penn State), coupling dynamical ice-sheet models to GCMs, to examine the sensitivity of the coupled atmosphere-cryosphere system to changing external boundary conditions. They are currently applying their new modeling scheme to the glacial history of Antarctica and Greenland.

The talk title and abstract are forthcoming and will be posted on the Vermont Geological Society website.

## **VERMONT GEOLOGICAL SOCIETY CALENDAR**

- March 20-22: Joint Northeastern and North-Central Section Meeting, Geological Society of America, Pittsburgh, Pennsylvania
  - April 1: Student Research Grant Program applications due
  - April 1: Student abstracts for Spring Meeting due
  - April 5: Executive Committee reports due
  - April 23: Spring Meeting, Delehanty Hall, Room 219, University of Vermont
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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	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	Stephen Howe
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*

**Vermont Geological Society  
Spring Meeting  
April 23, 2011, 9:00 AM  
Delehanty Hall, Rm 219, Trinity Campus  
University of Vermont, Burlington, Vermont**

Directions to Delehanty Hall:

Delehanty Hall is located at 180 Colchester Avenue, in Burlington, Vermont. It can be reached from I-89 by taking Exit 14E and following Route 2 (Williston Road) to the west to the intersection with East Ave. A right on East Ave will take you to Colchester Ave and upon crossing this you will enter a complex of university buildings that includes Delehanty Hall (behind Mann Hall).