

# THE GREEN MOUNTAIN GEOLOGIST



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

VGS Website: [www.uvm.org/vtgeologicalsociety/](http://www.uvm.org/vtgeologicalsociety/)

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*The Vermont Geological Society's*

## *Summer Field Trip*

*The Stanbridge Nappe in Vermont: A Reappraisal of its Allochthonous Nature  
Highgate Falls Gorge, Highgate Center, Vermont*

*June 24, 2006*

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**SUMMER FIELD TRIP DESCRIPTION AND ROAD LOG**

Saturday, June 24, 2006

TITLE: The Stanbridge Nappe in Vermont: A Reappraisal of its Allochthonous Nature

TIME: 9:00 AM – 5:00 PM

MEETING POINT INFORMATION: We will meet at 9:00 AM in the parking lot behind the UVM Geology Department at Delehanty Hall on the old Trinity College Campus adjacent to the University of Vermont. From I-89, take exit 14 (Main Street–Route 2 exit), and go west (towards the lake) to East Avenue. Turn right on East Avenue and go to the end of East Avenue and proceed straight across Colchester Avenue and into the driveway. Delehanty Hall has a slate exterior and large granite blocks in front of it. Once on the driveway, bear around to the left and the parking lot is in the rear. The first field trip stop near Highgate Center will be about an hour's drive from this location.

LEADER: Adam Schoonmaker, Department of Geology, UVM

FIELD TRIP DESCRIPTION: This trip will feature the spectacular exposure of upper Cambrian and Lower Ordovician carbonate shelf strata and overlying shales in the Highgate Falls Gorge, at Highgate Center, northwestern Vermont. Here, a continuously exposed, conformable sequence of sandy dolomitic breccias of the Gorge Formation and slaty limestones and limestone breccias of the Highgate Formation, are overlain by black slates of the Morses Line Formation. In Quebec, this sequence is inferred to contain a major tectonic boundary between allochthonous slaty limestones and slates (Highgate and Morses Line Formations) and underlying dolomites of the Laurentian shelf sequence. We shall examine the relationship of these rocks in the gorge and at selected stops to the north, near the International Border.

Also, beautifully exposed in the gorge, is the lightly studied Highgate Falls Thrust, an out-of-sequence thrust fault that is likely part of the larger Champlain Thrust system, and emplaces upper Cambrian dolomite breccias of the Gorge Formation over lower to mid-Ordovician black slates of the Morses Lines Formation. Additionally, diachronously evolved en echelon fractures sets (many showing various stages of rotation) and associated minor thrusts are well displayed throughout the slates beneath the thrust.

*Walking in the gorge can be somewhat treacherous due to boulder field in the channel—may be slippery if wet. Care should be observed, and adequate footwear is advised.*

FIELD TRIP ROAD LOG: (See above for information on departure location)

- 0.0 mi Parking Lot behind Delehanty Hall. Leave for main entrance at intersection of Colchester and East Ave.
- 0.1 Go straight through intersection onto East Ave.
- 0.8 Take left onto Main St.
- 1.3 Take right onto entrance ramp of I-89 North.
- 30.9 Take Exit 20 at St. Albans. Go right onto VT Route 207 North.

- 37.6 Go over bridge over Mississquoi River (Highgate Gorge).
- 37.9 Take right onto VT Route 78 (also follows VT 207).
- 38.1 Take right at village green (Mill Hill St). Take unlabelled street (also Mill Hill St?) by bearing right down to gorge.
- 38.4 Park at areas next to footbridge and Highgate Falls dam.  
**STOP 1: Highgate Falls Gorge.**
- Go back up Mill Hill St(?) to intersection with VT 78.
- 38.7 Take right onto VT 78 (also VT 207).
- 38.75 Take left to stay on VT 207 (leaving VT 78).
- 40.3 Take left onto Tarte Road.
- 41.8 Pull over and park just before small bridge over Rock River. **STOP 2: Highgate Formation.**
- 42.9 Take driveway on left at right-angle turn in road (Choiniere's blue house on corner). Pass through gate in electric fence (PLEASE CLOSE GATE AFTER ENTERING AND LEAVING!). Park in cow field. Mind your step here. **STOP 3: Choiniere Farm.**

## SPRING MEETING MINUTES

Saturday, April 29, 2006

The Spring Meeting was a great success, with 14 excellent talks by Middlebury students. Unfortunately, we had only two judges, Greg Walsh and myself, and this is an issue the Executive Committee will have to address prior to next year's Spring Meeting, to be held at the University of Vermont. I, acting as temporary secretary for Dave West, have summarized the Executive Meeting discussions below.

Once again, there was no quorum at the Executive Committee Meeting after the student presentations, with just Dave West and myself in attendance. I presented my usual Treasurer's and Advancement of Science Committee Reports and we discussed a number of the items that were brought up previously at the Winter Meeting. We agreed that we would like to have both a summer and a fall field trip, and that the fall field trip and annual meeting should be held on October 14th, the last day of Earth Science Week. This date also has the advantage of not conflicting with the dates for a number of other geological meetings in a crowded fall. We recommended that Rick Dunn and George Springston be asked to continue to serve as President and Vice President, respectively, for 2006-2007, but noted that we need 3 new candidates for the Board of Directors to take office in the fall. We commented on the success of Rick Dunn's tenure as VGS Lecturer and suggested the names of several candidates to bring up to the entire Executive Committee as potential future Lecturers. Finally, we recommended that it is not necessary for the Society to take a position concerning the Geological Society of America's statement about evolution.

Respectfully submitted,  
Stephen S. Howe

## **TREASURER'S REPORT**

The financial condition of the Society continues to be very strong. As of June 1, 2006, the Society's checking account balance was \$4,905.86. To my knowledge, there are no outstanding bills.

The following member has been approved for membership in the Society since the last report: Peter Ryan, Middlebury, VT.

Respectfully submitted,  
Stephen S. Howe, Treasurer

## **ADVANCEMENT OF SCIENCE COMMITTEE REPORT**

The Society's Spring Meeting was a showcase for the excellent research carried out by 14 Middlebury College undergraduate students. The following students received awards for their presentations:

1st Place Award and Doll Award (\$100): Nate Morris, Middlebury College  
2nd Place Award (\$75) (tie): Brad Michalchuk, Middlebury College  
2nd Place Award (\$75) (tie): Lynne Zummo, Middlebury College  
3rd Place Award (\$50): Hillary Brooks, Middlebury College

The Charles G. Doll Award, given for the top undergraduate student presentation, is a plaque with the student's name and school engraved on it that is kept at the student's school until the following year's Spring Meeting. The Spring 2007 Meeting will be held at the University of Vermont.

The Committee will recommend several dates in early March 2007, for the Society's next Winter Meeting. Members are encouraged to contact me with any suggestions they may have for a theme for the meeting.

The Committee received one application to the Society's Research Grant Program by the deadline of April 1, 2006. It awarded a partial grant to Elizabeth J. Barclay, from Dartmouth College, for her proposal "Vertical Infiltration of Particle-bound Contaminants into Stream Beds." Applications for the second round are due September 30, 2006. Please see the Society's website for details.

The Committee gratefully acknowledges the contribution to the Society's Research Grant Program by Peter Ryan.

Respectfully submitted,  
Stephen S. Howe, Chair

## **STATE GEOLOGIST'S REPORT**

In May 2006, the Vermont Legislature established a committee to report by January 2007 on a proposed schedule for the groundwater mapping of the State including a proposed funding mechanism. The State Geologist is named to the committee along with the Secretary of the Agency of Natural Resources, legislators, and others representing various interests. In anticipation of groundwater mapping finally achieving the status that it deserves, the Vermont Geological Survey has been developing prototype map products in recent years. Most recent offerings are the Draft Surficial Geology and Hydrogeology of Brandon, Vermont, by David DeSimone, and the Geologic Framework for Evaluating Ground Water Resources in the Southern Worcester Mountains, Central Vermont by Jonathan Kim, George Springston, Marjorie Gale, Richard Dunn, and Laurence Becker (a poster presented at the Northeastern Section Meeting of the Geological Society of America in March 2006). This is an exciting time, as groundwater contained within the geologic vessel will soon receive increased study with practical benefits for resource identification and protection.

Respectfully submitted,  
Laurence R. Becker, State Geologist

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**ANNOUNCEMENTS****NEW MEMBERSHIP DIRECTORY**

A new membership directory is enclosed in this issue of the Green Mountain Geologist.

**COMMUNICATIONS DIFFICULTIES WITH AOL E-MAIL ADDRESSES**

The Society wishes to alert VGS members that Stephen Howe, who normally sends out all Society e-mail correspondence, is unable to communicate intermittently with those members having AOL e-mail addresses. Until further notice, Kathleen Howe will send pertinent e-mail notices to AOL members instead. We remind all members to also check the Society's website frequently for updated calendar announcements.

**VERMONT GEOLOGICAL SOCIETY CALENDAR**

6/24/06	VGS Summer Field Trip, Highgate Center, Vermont
9/29-10/1/06	NEIGC 98 <sup>th</sup> Annual Meeting, Rangely, Maine
9/30/06	Student Research Grant Program Applications due
10/6-8/06	NYSGA Annual Meeting, Buffalo, New York
10/14/06	VGS Fall Field Trip and Annual Meeting
10/22-25/06	GSA Annual Meeting and Exhibition, Philadelphia
10/30-11/4/06	AEG Annual Meeting, Boston

The **GREEN MOUNTAIN GEOLOGIST** is published quarterly  
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**Executive Committee**

President	Richard Dunn	802-485-2304	rdunn@norwich.edu
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Secretary	David West	802-443-3476	dwest@middlebury.edu
Treasurer	Stephen Howe	518-442-5053	showe@albany.edu
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of	Tim Grover	802-468-1289	grovert@castleton.edu
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**Committees**

Advancement of Science	Stephen Howe
Education	Christine Massey
Membership	Stephen Wright
Public Issues	Laurence Becker
Publishing	Kathleen Howe, Stephen Howe, and David West

**Vermont Geological Society**  
**P.O. Box 1224**  
**Saint Albans, VT 05478-1224**

***ADDRESS CHANGE?***

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

**Vermont Geological Society**  
**Summer Field Trip**  
**June 24, 2006, 9:00 AM**  
**Delehanty Hall Parking Lot**  
**University of Vermont, Burlington, Vermont**

Directions to Delehanty Hall:

We will meet at 9:00 AM in the parking lot behind the UVM Geology Department at Delehanty Hall on the old Trinity College Campus adjacent to the University of Vermont. From I-89, take exit 14 (Main Street–Route 2 exit), and go west (towards the lake) to East Avenue. Turn right on East Avenue and go to the end of East Avenue and proceed straight across Colchester Avenue and into the driveway. Delehanty Hall has a slate exterior and large granite blocks in front of it. Once on the driveway, bear around to the left and the parking lot is in the rear.

## Vermont Geological Society 2006 Membership Directory

Name	Affiliation	Work telephone	E-mail	Interests
John J. Akielaszek	Vermont Agency of Natural Resources	(802) 241-3824	john.akielaszek@state.vt.us	
Veronica M. Alberico	OMYA Inc.	(802) 770-7245	bonnie.alberico@omya.com	Paleontology, mineralogy, collecting
Robert L. Allcott				
Caroline Alves	USDA/NRCS	(802) 865-7895	caroline.alves@vt.usda.gov	Surficial geology and soils
James W. Ashley			jashley@kingcon.com	Groundwater
Tania S. Bacchus	Johnson State College	(802) 635-1329	bacchust@jsc.vsc.edu	Oceanography, climate change
Robert L. Badger	SUNY at Potsdam	(315) 267-2624	badgerrl@potsdam.edu	Igneous and metamorphic petrology
Lori D. Barg			loribarg@together.net	Fluvial geomorphology, hydrogeology
Laurence R. Becker	Vermont Geological Survey	(802) 241-3496	laurence.becker@state.vt.us	Vermont State Geologist
Alice M. Blount	OMYA Inc.	(802) 770-7267	alice.blount@omya.com	Mineralogy
Michael R. Burke	JGI Eastern, Inc.	(603) 206-1122	mburke@jgieastern.com	Hydrogeology
David Butterfield				
John Carmola			carmola@verizon.net	
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Ray Coish	Middlebury College	(802) 443-5423	coish@middlebury.edu	Petrology, geochemistry
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Jeanne C. Detenbeck			rdetenbeck@aol.com	
Nathan P. Donahue		(802) 279-4459	donahues@tds.net	Glacial geology, Quaternary geology
Barry Doolan		(802) 656-0248	barry.doolan@uvm.edu	Appalachian geology and tectonics, metamorphic petrology
Jack Drake	University of Vermont	(802) 656-0244	john.drake@uvm.edu	Low-temperature aqueous geochemistry, limnology
			rdunn@norwich.edu;	
Richard K. & Gretchen J. Dunn	Norwich University	(802) 485-2304	gdunn@norwich.edu	Quaternary geology
Brett Engstrom		(802) 426-3534	engstrom@together.net	Ecological implications of geology
Shannon Foster	OMYA Inc.	(802) 770-7195	shannon.foster@omya.com	Mineralogy
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Marjorie & Peter Gale	Vermont Geological Survey	(802) 241-3608	marjorie.gale@state.vt.us; petemarjie@adelphia.net	
			wwgansz@madriv.com;	
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Lawrence W. Gatto			mlgatto@earthlink.net	Cryogenic soil response
Barbara George			georges@sover.net	Historic preservation
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Arthur W. Gilbert, Jr.			awgjr2171@earthlink.net	Petroleum geology
Richard P. Gillespie			idigrocks@comcast.net	Engineering and structural geology
Timothy W. Grover	Castleton State College	(802) 468-1289	grovert@castleton.edu	Metamorphic petrology, structural geology
Matthew J. Guerino	Environmental Compliance Services	(802) 434-4500	matt_guerino@hotmail.com	Surficial geology, glacial lakes
Susan H. Hadden				
Joseph J. Hayes	ECS	(802) 434-4500	jhayes@ecsconsult.com	Contaminant hydrogeology and remediation
Mike Heidorn	Mass Rural Water Association	(603) 835-2946	mheidorn@massrwa.org	Hydrogeology
Craig Heindel	Heindel & Noyes	(802) 658-0820	cheindel@gmavt.net	Hydrogeology, hydrology, glacial geology
Barbara L. Hennig			bhennig@capital.net	Geomorphology
J. Christopher Hepburn	Boston College	(617) 552-3642	hepburn@bc.edu	Tectonics, geochemistry
Arthur L. Hodges, Jr.				Geology of the Caribbean
Jefferson P. Hoffer		(802) 626-3077	geohoff@aol.com	
Stephen S. Howe	University at Albany	(518) 442-5053	showe@csc.albany.edu	Stable isotope geochemistry, paleoclimatology, ore deposits
John P. Jemsek		(413) 253-2100	jjemsek@netscape.net	
Leslie Kanat	Johnson State College	(802) 635-1327	les.kanat@jsc.vsc.edu	Education
Edwin Karp				Structural geology
Jon Kim	Vermont Geological Survey	(802) 241-3469	jon.kim@state.vt.us	
John Klimenok, Jr.	Vermont Agency of Natural Resources	(802) 476-0193	john.klimenok@state.vt.us	Hydrogeology
Kent S. Koptiuch	KSK Geo-Environmental Services	(802) 878-1620	kskgeos@aol.com	Environmental hydrogeology

## Vermont Geological Society 2006 Membership Directory

Name	Affiliation	Work telephone	E-mail	Interests
Carl Koteff	U.S. Geological Survey, emeritus		ckoteff@cox.net	Surficial geology, Quaternary geology
Ronald B. & Anita H. Krauth			rakrauth@gmavt.net	Ground water, fractures, geologic education
Carol Lacy	Essex High School	(802) 879-8186	clacy@ejhs.k12.vt.us	Earth science teacher
Eric T. Lapp		(800) 451-4468	etlapp@yahoo.com	Mineral resources, economic geology
Frederick D. Larsen	Norwich University, emeritus	(802) 485-2336		Glacial geology, geomorphology
Crea & Philip Lintilhac				
Cassandra Major	Vermont Science Teachers Assoc.	(802) 476-6617	majorinv@aol.com	Elementary and middle school earth science
John A. Malter	Malter Consulting, Inc.	(802) 244-7373	malterport@aol.com	Waste management and remediation
Helen Mango	Castleton State College	(802) 468-1478	helen.mango@castleton.edu	Geochemistry, ore deposits, environmental geology
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Donald M. Maynard	The Johnson Company	(802) 229-4600	dmm@jcomail.com	Hydrogeology, environmental geology, glacial stratigraphy
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Andrew McIntosh	OMYA, Inc.	(802) 770-7165	andy.mcintosh@omya.com	Calcium carbonate geology, glacial geology
Mary Ann Mento			mentovt@yahoo.com	New England earthquakes
Ronald W. Miller	ECS	(802) 434-4500	rmiller@ecsconsult.com	Environmental geology, hydrogeology, and structural geology
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Alexis P. Nason				Mine and exploration geology; geochemical prospecting
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Sharon B. O'Loughlin				Environmental geology
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Sanborn Partridge				
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Charles A. Ratté			ratatat@gis.net	Geology of Vermont, geohydrology of Martha's Vineyard
Stephen Revell	Lincoln Applied Geology, Inc.	(802) 453-4384	srevell@lagvt.com	Hydrogeology and environmental consulting
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George Springston	Norwich University	(802) 485-2734	gsprings@norwich.edu	Natural hazards, remote sensing
Matthew T. Stein	Sanborn, Head, & Assoc.	(603) 229-1900	mt_stein@hotmail.com	Environmental consulting
Sharon Strassner			sstrassn@middlebury.edu	
Art Stucky	MWH Global	(312) 831-3214	arthur.h.stucky@mwhglobal.com	Engineering geology, glacial geomorphology
Eric Swiech	Applied Geosolutions	(802) 485-9466	ericswiech@hotmail.com	Hydrogeology, soil and groundwater remediation
Peter J. & Thelma B. Thompson	University of New Hampshire	(603) 862-4995; (603) 862-1132	pjt3@cisunix.unh.edu; thelmat@cisunix.unh.edu	New England tectonics; geoscience information
Roger & Terry Thompson		(802) 241-3027		
Kristen L. Underwood	South Mountain Research & Consulting	(802) 453-3076	southmountain@gmavt.net	
John G. Van Hoesen	Green Mountain College	(802) 287-8387	vanhoesenj@greenmtn.edu	Quaternary geology, alpine/periglacial geomorphology
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David S. Westerman	Norwich University	(802) 485-2337	westy@norwich.edu	Igneous petrology and structural geology
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Richard & Susy Ziegler		(651) 489-5369	geo_logical2@hotmail.com	Groundwater aquifer testing; research