

# THE GREEN MOUNTAIN GEOLOGIST

QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

SUMMER/FALL 1997

VOLUME 24

NUMBER 3/4

## NEIGC MEETING/VGS FALL MEETING PICO SKI AREA

Friday, Saturday, Sunday  
September 19, 20, 21

*VGS Annual Meeting following the NEIGC Banquet  
at Pico Ski Area Base Lodge, 8:30 PM*

See inside for details.

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**THE GREEN MOUNTAIN GEOLOGIST**  
 VERMONT GEOLOGICAL SOCIETY  
 DEPARTMENT OF GEOLOGY  
 UNIVERSITY OF VERMONT  
 BURLINGTON, VERMONT 05405-0122

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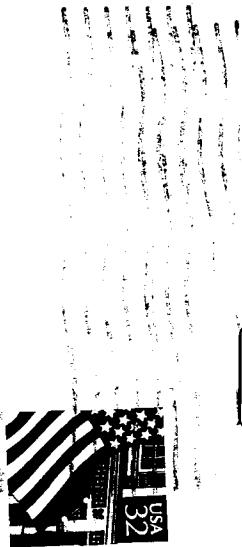
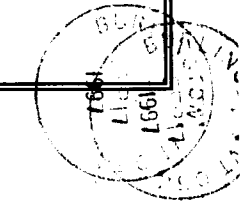
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#### ADDRESS CHANGE?

Please send it to the Treasurer at the above address.  
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## NEW ENGLAND INTERCOLLEGIATE GEOLOGICAL CONFERENCE (NEIGC) FALL FIELD TRIPS

### ORGANIZERS

The organizers of this year's NEIGC conference are Tim Grover and Helen Mango of Castleton State College. They may be contacted at the following addresses:

Helen: 802-468-1478; mangoh@sparrow.csc.vsc.edu

Tim: 802-468-1289; grovert@sparrow.csc.vsc.edu

Castleton State College—NEIGC  
Department of Natural Sciences  
Castleton State College  
Castleton, VT 05735

### REGISTRATION

Registration forms and information are available from Castleton. Registration fees are \$10 in advance and \$15 on-site. The Guidebook is available for an additional \$15 and the fee for the banquet is \$12. A special undergraduate student registration fee of \$14 includes both registration and the Banquet.

### SCHEDULE OF EVENTS

Friday night welcoming party and registration will be at the Inn at Long Trail along Rt 4, atop Sherburne Pass, beginning at 6 PM.

The Saturday evening banquet will be held at the Pico Ski area Base Lodge, with events beginning at 6:30 PM. The Vermont Geological Society Annual Meeting will take place after the Banquet, ~8:30 PM.

### STARTING TIMES AND PLACES FOR FIELD TRIPS

Starting times and places are listed for each field trip on the following pages.

### NEIGC WEB PAGE

The above information and more detailed information about individual field trips is available on the NEIGC Web at the following address:

<http://kilburn.kene.edu/earthscience/neigc/neigc.html>

FRIDAY SEPTEMBER 19

#### Trip A1: DEFORMATION OF THE TACONIC SEQUENCE, WESTERN VERMONT AND EASTERN NEW YORK

Leaders: Art Goldstein, Yu Chang Chan, Jim Pickens, Jean Crespi

Departure Time and Place: 8:30 AM, MacDonalds, located at Exit 2 off Rt. 4, in Fair Haven

#### Trip A2: NAPPES, GNEISS DOMES, AND PLUTONIC SHEETS OF WEST-CENTRAL NEW HAMPSHIRE

Leader: Tim Allen

Departure Time and Place: 8 AM, Intersection of Routes 2 and 4 in Fair Haven, Vermont

#### Trip A3: STRATIGRAPHY AND SEDIMENTOLOGY OF THE MIDDLE ORDOVICIAN SEQUENCE AT CROWN POINT STATE PARK, NEW YORK

Leaders: Charlotte Mehrrens, University of Vermont; Bruce Selleck, Colgate University

Departure Time and Place: 9:30 AM, State campground entrance at Crown Point State Park

#### Trip A4: WILSON-CARBON CYCLE LINKAGES: THE IAPETAN CYCLE AND EARLY PALEOZOIC CLIMATE

Leader: Doug Reusch, University of Maine

Departure Time and Place: 8 AM, Public Boat Launch and Picnic Area in Port Henry: Take Beach Rd, which intersects NY Rt 9N/22 0.3 miles north of the center of Port Henry (Jct of NY 9N/22 and Broad Street).

#### Trip A5: GLACIAL GEOLOGY OF THE CENTRAL CHAMPLAIN VALLEY, VERMONT

Leader: Craig Heindel

Departure Time and Place: 9 AM, Pico Ski Area Parking Lot

#### Trip A6: A TRANSECT ACROSS THE CONNECTICUT VALLEY SEQUENCE IN EAST-CENTRAL VERMONT

Leaders: Thomas R. Armstrong, Gregory J. Walsh, Frank S. Spear

Departure Time and Place: 7:30 AM, Grand Union Parking Lot in the Springfield Plaza

SATURDAY, SEPTEMBER 20

**Trip B1: THE APPALACHIAN FORELAND AS SEEN IN NORTHERN VERMONT**

Leaders: Rolfe Stanley and Stephen Wright, Co-leaders: Todd Martin, Jim Talcott, Ben Copans, University of Vermont  
 Departure Time and Location: 9 AM, Apple Store just west of the South Hero post office in the Village of South Hero

**Trip B2: PLUTONIC AND HYPABYSSAL INTRUSIONS OF THE EARLY CRETACEOUS CUTTINGSVILLE COMPLEX, VERMONT**

Leaders: G. Nelson Eby, Univ. of Massachusetts, Lowell, J. Gregory McHone, Wesleyan Univ.  
 Departure Time and Location: 9 AM, Highway rest area (south of Rutland) on the west side of Route 7, approximately 0.4 miles south of the intersection with Rt. 103.

**Trip B3: BASEMENT-COVER RELATIONSHIPS IN SOUTHERN VERMONT**

Leaders: Paul Karabinos, Williams College and James B. Thompson, Jr., Harvard University  
 Departure Time and Place: 8:30 AM, Pico Ski Area Parking Lot

**Trip B4: ECONOMIC GEOLOGY OF THE DIMENSION STONE INDUSTRY EASTERN VERMONT GRANITE BELT**

Leaders: Dorothy Richter, Hager-Richter Geoscience, Inc., Salem, New Hampshire, and Donald Murray, P.E., Rock of Ages Corporation, Barre, Vermont  
 Departure Time and Location: 8 AM, McCullough's Quick Stop (Citgo), south side of Rt 107 in Bethel

**Trip B5: ENVIRONMENTAL HYDROGEOLOGY: A TWO-PART FIELD TRIP. 1) DISPOSAL OF TREATED SEWAGE EFFLUENT BY SPRAY IRRIGATION ON A FORESTED HILLSIDE; 2) AIR SPARGING AND SOIL VAPOR EXTRACTION AT A GASOLINE CONTAMINATION SITE.**

Leader: Chris Aldrich, Heindel and Noyes, Burlington  
 Departure Time and Place: 9 AM, Pico Ski Area Parking Lot

**Trip B6: STRATIGRAPHY, GEOCHRONOLOGY, AND TECTONIC EVOLUTION OF THE BASEMENT AND COVER ROCKS OF THE CHESTER AND ATHENS DOMES**

Leaders: Nicholas Ratcliffe, Gregory Walsh, John Aleinikoff  
 Departure time and Place: 7:30 AM Pico Ski Area Parking Lot

SUNDAY SEPTEMBER 21

**Trip C1: HOW DOES NEW HAMPSHIRE CONNECT TO VERMONT?**

Leaders: J. B. Thompson, Jr., J. L. Rosenfeld, J. C. Hepburn, and W. E. Trzcienski  
 Departure Time and Place: 8 AM, Village Green, before the Inn, Chester, Vermont

**Trip C2: STRATIGRAPHY AND STRUCTURE OF THE ORWELL 15' QUADRANGLE, WEST-CENTRAL VERMONT**

Leader: Helen Mango, Castleton State College,  
 Departure Time and Place: 8:30 AM, Pico Ski Area Parking Lot

**Trip C3: THE POTSDAM SANDSTONE OF THE SOUTHERN CHAMPLAIN VALLEY: SEDIMENTOLOGY, STRATIGRAPHY, AND DIAGENESIS**

Leader: Bruce Selleck, Colgate University  
 Departure Time and Place: 8:30 AM Parking area along Lake Champlain on NY Rt 22, ~1.5 miles north of intersection of Rt 22 and Rt 4 (in Whitehall)

**Trip C4: LATE PLEISTOCENE/HOLOCENE HISTORY IN THE MILLER BROOK AND HUNTINGTON VALLEYS, NORTHERN VERMONT**

Leaders: Stephen Wright, Paul Bierman, Timothy Whalen, Paul Zehfuss, University of Vermont  
 Departure Time and Place: 8 AM, Pico Ski Area Parking Lot

**Trip C6: BASEMENT, METASEDIMENTARY AND TECTONIC COVER OF THE GREEN MOUNTAIN MASSIF AND WESTERN FLANK OF THE CHESTER DOME**

Leaders: Nicholas Ratcliffe, Gregory Walsh, John Aleinikoff  
 Departure time and Place: 7:30 AM Pico Ski Area Parking Lot

**VERMONT GEOLOGICAL SOCIETY ANNUAL MEETING**

Given the many field trips offered in association with this year's NEIGC meeting, the Vermont Geological Society will not be host a Fall field trip this year. We will have our annual meeting on Saturday evening, September 20, following the NEIGC Banquet. A slate of new Officers is presented on the ballot printed as the last page of this issue of the GMG. In addition to voting for new Society officers, other business coming before the Society will be discussed.

## Vermont Geological Society Field Trip- August 2, 1997

### Bedrock Geology of the Stowe-Moretown Belt: Northern Vermont

Jonathan Kim, RR1 Box 1612-9, Hyde Park, Vermont 05655

Editors' Note: We regret that this description of the geology of the ??? area was not published prior to this summer's field trip. Nevertheless, we hope that members will enjoy reading a description of the Jonathan Kim's field area below.

In northern Vermont, the Stowe-Moretown Belt is a northern extension of the Rowe-Hawley Belt of the western New England Taconide Zone. The Rowe-Hawley Belt *sensu stricto* extends from western Connecticut to central Vermont. The Stowe-Moretown Belt is a complex assemblage of meta-sedimentary and meta-igneous rocks of diverse origins that were initially deformed and metamorphosed during the Ordovician Taconic Orogeny. The Stowe Formation is presumed to be Late Proterozoic-Cambrian rift and passive margin sediments incorporated into the Taconic accretionary prism, whereas the Moretown Formation may represent forearc basin fill or continentally-derived trench deposits.

Recent bedrock geologic mapping in parts of the Hazens Notch, Lowell, Irasburg, Eden, and Albany quadrangles demonstrates that the original assumptions of stratigraphic continuity within and among formations proposed by the first bedrock geologic maps of the area are largely invalid. Lithologic contacts in the central Stowe Formation are a series of anastomosing thrust faults that compose a major fault zone (informally-named Eden Notch Fault Zone that juxtapose diverse rock types over relatively short distances. Anastomosing thrust faults are also found surrounding the major ultramafic bodies in the northwest part of the map area in the vicinity of the Stowe/Ottawaquechee contact. The Lowell Mountain "Anticline" in this map area is a north-plunging synformal structure that is in tectonic contact with the Umbrella Hill Conglomerate to the east as demonstrated by a well-developed generally steeply-plunging stretched quartz pebble lineation; this synformal structure is truncated along its western side by the Eden Notch Fault Zone.

The western Stowe Formation (informally-named Mt. Norris member) is composed primarily of gray-green quartzose phyllites and massive granular boudinaged mafic layers whereas the eastern Stowe Formation (informally-named Lowell Mt. member) is primarily composed of black quartzose phyllite interlayered with gray-green quartzose phyllite and wide mappable layers of black quartzose phyllites that define the synformal structure of the Lowell Mt. "Anticline". The eastern and western members of the Stowe Formation are separated by a large greenstone body.

There appears to be a structural discontinuity between rocks of the Stowe Formation and Moretown Formation to the east since structural fabrics in the Stowe Formation are significantly more complex. Moretown Formation rocks are diverse and are composed of interlayered light gray-green granofels and phyllites and greenstones in the west and dark gray to black phyllites, phyllitic granofels, gray quartzites, and local mafic intrusive layers in the east (Cram Hill "member").

This field trip traverses the various lithologies and structures in the Stowe-Moretown Belt in northern Vermont to give the participant an overview of the differences that are evident between the new mapping and the pre-plate tectonic mapping.

## STATE GEOLOGIST'S REPORT

Laurence R. Becker

Vermont State Geologist and Director, Vermont Geological Survey

### *Geologic Mapping:*

As the bill stalled along with many in the 104th Congress, the reauthorization for the National Geologic Mapping Act is again before the 105th Congress (HR704 and S317). For support, the State Geologist contacted Congressional staff from Senators Leahy, Jeffords and Rep. Sanders Washington offices. The National Geologic Mapping Act authorizes STATEMAP, which is the grant that fund mapping in the northern part of the Vermont. The USGS maps being produced in southern Vermont are funded under FEDMAP. The University of Vermont has received EDMAP funds from this Act. Monies from this appropriation are crucial to maintaining a very productive cooperation between the State, academic community, and the Federal government. At present the administration budget has a shortfall in the STATEMAP and EDMAP appropriation. Vermont could be adversely affected. I would urge you to support this legislation with full funding, as information derived from this mapping can be used to address a variety of environmental issues and resource questions.

### *GIS Expo:*

The Vermont Survey participated in the *GIS Expo* held in Montpelier on February 18th. Open-file and prototype digital geologic maps were displayed. Greg Walsh from the USGS in Reston was in attendance to highlight the cooperation between the State and Federal Government in producing digital geologic maps in conjunction with the Information Management Section of the Agency. As a Vermont Center for Geographic Information Board member representing the Agency, the State Geologist attended the kick off meeting of Vermont's grant to participate in the National Digital Geospatial Data Framework to improve coordination between creators and users of GIS data.

### *Water In Fractured Bedrock:*

The Vermont Survey is part of a developing cooperation with both the USGS Water Resources and Geologic Divisions and the Rutland Regional Planning Commission to study water in fractured bedrock. The proposed project intends to define the areas with the greatest potential to yield water to bedrock wells in the eastern part of Rutland County. The intent is to create a prototype regional study for planners and provide background information to consultants locating wells in a growth area. In

a March 31, 1997 letter to Gordon Eaton (Director of the USGS), Vermont Agency of Natural Resources Secretary, Barbara Ripley, supported the search for funds for this project. She also designated the State Geologist as the point of contact between USGS representatives and other elements of the Agency.

#### *Quarries and Act 250:*

The season for quarry reviews under Act 250 criteria 9E is upon us. At present, four are under review. An example is the State Geologist's visit to the OMYA, Middlebury crushed rock operation. An expansion is planned to the south along with the development of a private access road directly to Route 7 to remove truck traffic from a residential neighborhood on Foote Street.

#### *Stream Geomorphology:*

The first phase of a four phase project to study Watershed Hydrology Protection and Flood Hazard Mitigation is underway with the release of a "Request for Proposals." A consultant will be asked to conduct a literature search that focuses on the nature of change in stream hydrology, morphology, water quality, and aquatic ecosystems. The consultant will then examine how land use change may contribute to changes in stream hydrology and morphology. As a link to Phase II, the consultant will provide recommendations on how to determine thresholds of watershed land use change which, when passed, result in an unacceptable reaction in a stream with accompanying effects on water quality and aquatic ecosystems. A study of flood damage reports from an August 5, 1995 event is also part of the RFP. Proposals are due by May 15, 1997.

#### *Missisquoi Bay:*

The draft final report for Phase II of the Missisquoi Bay Hydrodynamic Study is complete. The field study and a new six month computer simulation are the subject of the second phase. At an April 16th meeting in Swanton, the consultant will present the draft findings.

You can contact the State Geologist's Office by calling : (802) 241-3608, or writing to: State Geologist Agency of Natural Resources; 103 South Main Street—Center Building; Waterbury, Vermont 05671-0301

## WATER NEWS

by Kent S. Koptiuch, CGWP

While completing a recent 72 -hour constant discharge pumping test for a community water supply system recently, I was reminded for the thousandth time of just how fortunate we are in this part of the world. Ironically, at the same time, I was also reminded of how tenuous that good fortune can really be.

You see, coincidental with my testing activities, a series of low pressure warm fronts combined with major convectional upwelling, was creating a series of severe thunderstorms that rolled right over me (to the tune of six inches of rain). These storms, and the flash floods that followed, wreaked havoc upon the Montgomery Center area, just east of my test well, and prompted the governor to declare the area a disaster zone.

Water is such a critical component of our everyday life yet, most of the time, we take it for granted. Until the occasion arises where we find ourselves confronted with either too much, or too little of the elixir. There I was, trying to determine if a water source would provide an adequate supply to a local populace, while twenty-five miles away the local populace was wishing that they would never see another drop of water. At the same time, the highest priority item requested from those of us donating time, energy, and aid into the flood relief program was, not surprisingly, bottled drinking water!

Whenever disaster strikes, it never ceases to amaze me how much strength a region can pull together in terms of victim assistance. In addition to the out-pouring of donated labor, equipment, food, and clean-up supplies, one item truly exemplified this strength and highlighted the critical importance water in our lives; this was the donation of \$1,000 dollars worth of coliform analyses to test the flood victims' water supplies. Hats off to Green Mountain Laboratories in Montpelier for putting public health above profit! And hats off to the thousands of other individuals and companies that I have not mentioned specifically!

My only criticism regarding flood relief programs lies in the way we permit, and in fact encourage, the rebuilding of homes and businesses in flood-prone areas. This is true on a nationwide basis; we as a community, can not seem to fathom the concept that nature can not be tamed. If an area floods once, it will in all likelihood flood again in our lifetime. Our tax dollars would be much better spent relocating impacted residents and businesses rather than assisting them in rebuilding on the same location only to be flooded out once more in the future. This administrative folly is evident after every severe storm event, whether it involves river valley flooding, or coastal storm destruction. Sure, nobody wants to lose their hard-earned property or home, but if they insist on rebuilding in the same location, let them do it without our tax dollars!

## SEMINARS, MEETINGS, AND FIELD TRIPS

September 15: University of Vermont Fall Seminar Series (4:30 P.M.):  
*"Bedrock to atmosphere shifts in the source of base cations to ecosystems: Sr isotopic evidence"* Martin Kennedy, University of California at Los Angeles

September 19-21: NEIGC Field Conference, Rutland, Vermont: See this issue of the GMG for details.

September 21-28: Vermont Archeology Week: Contact Giovanna Peebles, State Archeologist (828-3050) for information on field trips and other activities. VGS member Vic Rolando will be leading guided tours in Brandon (Forestdale Ironworks), Winhall (old Peru turnpike - charcoal kiln and mill remains), and Glastenbury (more charcoal kiln and abandoned village site).

September 26-28: New York State Geological Association Annual Meeting and Field Trips, Hamilton College, New York

September 29: University of Vermont Fall Seminar Series (4:30 P.M.):  
*"The evolution of the deep crust: Interaction of mantle, magma, metamorphism, and deformation in the East Athabasca Mylonite Triangle, Saskatchewan"* Michael Williams, University of Massachusetts

October 27: University of Vermont Fall Seminar Series (4:30 P.M.): *"The viscosity of granitic melts and their escape from source regions"* Don Baker, McGill University

November 3: University of Vermont Fall Seminar Series (4:30 P.M.):  
*"Holocene climate change on the Yucatan Peninsula: Implications for Mayan cultural evolution"* David Hodell, University of Florida

November 12: University of Vermont Fall Seminar Series (4:30 P.M.):  
*"Nutrients and ocean history: A focus on phosphorus"* Peggy Delaney, University of California at Santa Cruz

## ABSENTEE BALLOT: 1996 Vermont Geological Society

### Officers:

President	Tania Bacchus	_____	_____
Vice-President	Marjorie Gale	_____	_____
Secretary	Jeff Pelton	_____	_____
Treasurer	Allan Carpenter	_____	_____

### Board of Directors (Select 2):

Kent Koptiuch	_____
Kristen Underwood	_____
_____	_____

If you will not be attending the 1997 VGS Annual Meeting, please complete this ballot and return it in an envelope marked with the word "BALLOT" in the lower left hand corner and your name and address in the upper left hand corner to:

Allan Carpenter, Treasurer VGS  
 Department of Geology  
 University of Vermont  
 Burlington, VT 05405

To be counted, this ballot must be received by September 20, 1997.