http://www2.newpaltz.edu/glaciogram

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Editorial Policy

The *New York Glaciogram* is intended to be an annually compiled collection of informal notes concentrating on Quaternary work that relates to New York State either directly or indirectly. The Glaciogram is not a formal publication and is not circulated to libraries, nor to individuals not engaged or interested in Quaternary research. The information included is often of a preliminary and tentative nature, and as such, should not be quoted without direct communication with the appropriate authors. It is suggested that reference to information in the Glaciogram be identified merely as informal communication. Please contact individual contributors for permission to reprint any information published here.

Invitation From The Editor

As the title implies, past issues of the *New York Glaciogram* have contained entries weighted toward Glacial Geology. My predecessor believed, as do I, that we should expand the coverage to also include topics that may be closely related to glacial geology, such as limnology, palynology, soil science, ground water geology, environmental geology, etc. I will be collecting contributions for the next edition in the Fall of 2009. Deadline for next year's contributions will be Monday, November 30th, 2009. If you have any meetings, fieldtrips or other announcements that you would like put on the Glaciogram website, please contact me. Over the next year I will also be working on making the Glaciogram picture archive functional. There is also a Glaciogram e-mail list, to which only I can send to (for now). I will be creating a subscription button on the web-page when I have time. If you want to be subscribed before that function becomes operational, please send me an e-mail.

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New York State Geological Association 81st Annual Meeting

September 25-27, 2009, New Paltz, NY

Hosted by
SUNY New Paltz, Department of Geological Sciences

I am pleased to announce that the 81st Annual Meeting of the New York State Geological Association will be hosted by SUNY New Paltz September 25-27, 2009. The meeting will be held at the College, which overlooks the scenic Shawangunk ridge. Fall colors are expected to be magnificent, and there are many opportunities to extend your stay for hiking, biking, or rock climbing in Minnewaska State Park or on the Mohonk Preserve. New Paltz has a spectacular diversity of local geology, and we have a wide range of trips planned with something for everyone. Tentative trips include:

- Fluvial geomorphology of the Catskills
- Deglacial history of the Mid-Hudson Valley
- Transect of the Paleozoic bedrock geology from the Hudson River to the Catskills
- Pre-Ottawan rocks and tectonic infrastructure of the Hudson Highlands
- Glacial geology of the North-South Lake area and the Hudson River School of Painting
- Structures of the Mid-Hudson Valley fold and thrust belt
- Hydrologic studies and the Brook Farm Project, implications for sustainable agriculture
- Barrovian metamorphic sequence of Dutchess County
- Geology of the Ordovician strata in the East Kingston Quadrangle
- Devonian stratigraphy of the Catskills
- Paleoecology of Middle Devonian Shales

Registration and accommodation information will be posted the New Paltz Geology web page, please check back there or at the NYSGA page (links below). A Friday night mixer is planned, and a Saturday banquet with a keynote speaker. As always, we strongly encourage undergraduate student participation in NYSGA, and expect to have special student rates for the meeting and banquet.

I look forward to seeing you in New Paltz in September 2009.

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Northeastern Friends of the Pleistocene 2009 Meeting

DEGLACIATION OF THE CHAMPLAIN SEA BASIN, EASTERN ONTARIO

Where: Ottawa, Ontario **When: June 6 – 7, 2009**

The Champlain Sea was an inland arm of the Atlantic Ocean that invaded the St. Lawrence Lowland following retreat of the Laurentide Ice Sheet. The sea lasted for about two thousand years (12,000–9.500 ^{14}C yr BP), its level falling continuously as the crust rebounded isostatically. Although both glacier and sea are now gone, the sediment they left behind preserves a detailed record of the deglacial event history, and remains integral to life in the Lowland. It is farmed extensively, mined for aggregate, and used as a substrate for waste disposal. Buried eskers host abundant supplies of potable groundwater (Figure 1) and Champlain Sea mud is prone to slope failure.

The Geological Survey of Canada has worked in the Champlain Sea basin for over 100 years, accumulating an extensive body of outcrop, core, and seismic data in the process. Field-trip stops will draw from this collective experience, and will touch upon key controversies surrounding the deglacial event history of the basin. Fundamental hypotheses on the origin of sculpted-bedrock forms, eskers, and mud-rich glaciated basin fills will be discussed. Classic field stops will be visited, including the world-class Cantley sculpted-bedrock site, the Kemptville esker where Brian Rust coined the term "subaqueous outwash", and a stop that exposes a succession of Champlain Sea mud that is very similar to the classic succession described by Antevs.

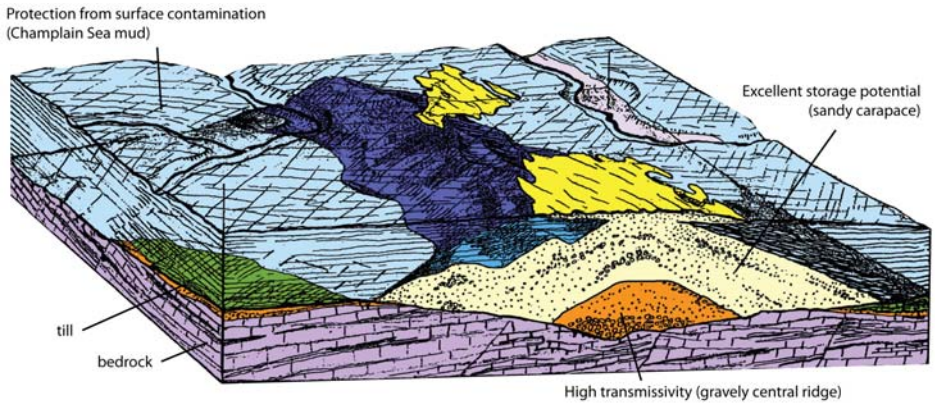

Figure 1. Cartoon of a typical esker aquifer in the Champlain Sea basin. Eskers are the best source of drinking water in the region.

STOP LEADERS (*1 – Geological Survey of Canada, Ottawa, Ontario; 2 – Organizers*)

Jan Aylsworth[1]	Paleolandslides (geotechnical)
Greg Brooks[1]	Seismic microzonation mapping (geotechnical)
Don Cummings[1,2]	Esker aquifers (sedimentology, dcumming@nrcan.gc.ca)
Marc Hinton[1]	Esker aquifers (hydrogeology)
André Pugin[1]	Subglacial meltwater erosion (geophysics)
Susan Pullan[1]	Esker aquifers (geophysics)
Hazen Russell[1,2]	Subaqueous outwash fan (sedimentology, hrussell@nrcan.gc.ca)
David Sharpe[1]	Subglacial meltwater erosion (glacial geology)

Registration and Accommodation: See the FOP website in January
http://www.climatechange.umaine.edu/friends/

New York State Geological Survey & Museum

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The New York Survey continues to complete mapping in Onondaga County with Don Pair and just two weeks ago completed three exploration boreholes in the Syracuse channels. We have just had two new hires and are planning to initiate a new Glacial geologic mapping program in the Catskills as part of a cooperative-agreement with NYDEP. In early November a collaborative project was begun with William Kappel of the USGS to investigate reports of deeply buried trees and peat layers. A week later the 12 shallow cores were collected from a Bedrock depression associated with the Cohoes mastodon in Cohoes, NY. Presently the Survey is completing a chronology study of the Albany dunes as part of an archeological and late glacial study with the New York State Museum. Lastly the Survey is involved in a study of the drumlins and micro fabrics in Central New York being directed by Ed Evenson of Lehigh in the Wolcott Quadrangle.
****

Vermont Geological Survey

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The Vermont Geological Survey (VGS) recently completed two STATEMAP surfical mapping projects on September 30, 2008 for the Town of Londonderry (David DeSimone, Vermont Geological Survey) and for the Marshfield/Peacham area (George Springston, Norwich University). Mapping for the Town of Rutland is underway (John Van Hoesen, Green Mountain College and Dave DeSimone). Surficial mapping in the Town of Charlotte will begin in the spring of 2009 (George Springston). Surfical and bedrock projects have been combined in a number of cases and groundwater resource derivative maps have been developed by employing located water well data and the new geologic mapping. Poster sessions presented at Northeast GSA in March 2008 and March 2007 are examples of the use of surficial geology for an applied purpose in cooperation with our Town partners. The following posters can be viewed at the VGS web site:

Groundwater Resources of Williston, Vermont
(2008, Laurence Becker, Jonathan Kim, David DeSimone, Marjorie Gale and George Springston)
http://www.anr.state.vt.us/dec/geo/WillistonWaterPoster/WillistonWater.htm

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Groundwater Resources of Woodstock, Vermont
(2007, Laurence Becker, David DeSimone, Peter Thompson (UNH), and Marjorie Gale)
http://www.anr.state.vt.us/dec/geo/WoodstockWater.htm
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New Hampshire Geological Survey

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SURFICIAL GEOLOGIC MAPPING PROGRAM IN NEW HAMPSHIRE

The New Hampshire Geological Survey, a bureau of the New Hampshire Department of Environmental Services (NHDES), has been mapping the surficial geology of the state on a quadrangle-by-quadrangle basis (1:24,000) for over 15 years. To date, 91 of the 213 quadrangles (43 percent) have been mapped. The program has been co-funded annually since 1996 through the STATEMAP component of the National Cooperative Geologic Mapping Program of the U.S. Geological Survey. Four to five quadrangles are completed each year. Mapping is largely carried out by contract mappers who have years of experience mapping surficial geology in New Hampshire as well as in adjoining states. (As manager of the surficial mapping program, I map one quadrangle each year as well.)

New Hampshire has been glaciated several times in recent geologic history, and the resulting surficial geologic materials directly affect all forms of land use. Engineering properties of these surficial deposits have significant implications for highway and building-foundation construction and for waste management. In addition, surficial deposits contribute much of the water supply for communities in New Hampshire. Geologic maps are important sources of information that support the evaluation and protection of surface and ground-water supplies and water quality. Other applications include land-use planning, foundation analysis in construction, transportation design, resource evaluation of surficial deposits as a source of aggregate and other construction materials, recreation, and evaluation of seismic risk and slope stability.

Aside from their environmental and economic value, surficial geologic maps contribute significantly toward interpreting geologic history. Mapping and other data obtained throughout the northeastern states (New York and New England) and in Canada have been crucial in understanding episodes of glaciation and deglaciation during the Pleistocene. The surficial geologic mapping program of the New Hampshire Geological Survey provides valuable information that advances our understanding of Quaternary events in the greater northeastern region.

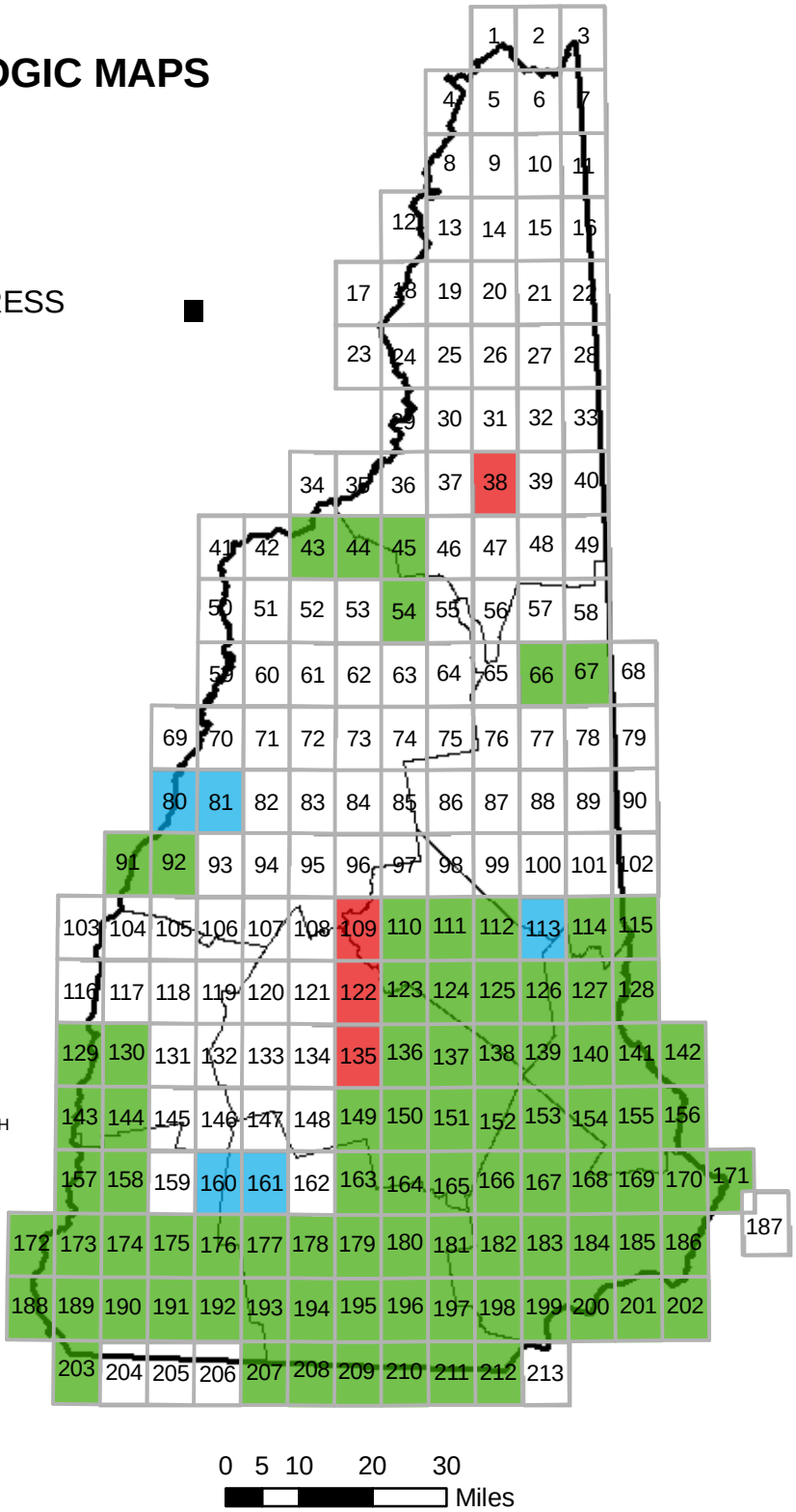
An Index mapped is included here to illustrate the extent of the coverage to date as well as forthcoming and proposed mapping. Surficial maps are digitized and, upon editorial review, quadrangles are made available for purchase through the DES Public Information Center (603-271-2975; www.des.nh.gov). Many of the maps are available as published (printed) quadrangles. Others, including those recently produced, may be printed on-demand for the customer.

National Cooperative Geologic Mapping Program

NEW HAMPSHIRE
INDEX OF SURFICIAL GEOLOGIC MAPS

Status

- PROPOSED MAPPING
- CURRENTLY IN PROGRESS
- COMPLETE
- County Boundaries



TILE NO.	QUAD NAME
38	PLINY RANGE EAST
43	LITTLETON
44	BETHLEHEM W
45	BETHLEHEM E
54	SOUTH TWIN MTN.
66	NORTH CONWAY WEST
67	NORTH CONWAY EAST
80	LYME
81	SMARTS MOUNTAIN
91	HANOVER
92	ENFIELD
109	BRISTOL
110	WINNISQUAM LAKE
111	LACONIA
112	WEST ALTON
113	WOLFEBORO
114	SANBORNVILLE
115	GREAT EAST LAKE
122	FRANKLIN
123	NORTHFIELD
124	BELMONT
125	GILMANTON IRONWORKS
126	ALTON
127	FARMINGTON
128	MILTON
129	SPRINGFIELD
130	CLAREMONT SOUTH
135	WEBSTER
136	PENACOOK
137	LOUDON
138	PITTSFIELD
139	PARKER MOUNTAIN
140	BAXTER LAKE
141	ROCHESTER
142	SOMERSWORTH
143	BELLOWS FALLS
144	ALSTEAD
149	HOPKINTON
150	CONCORD
151	SUNCOOK
152	GOSSVILLE
153	NORTHWOOD
154	BARRINGTON
155	DOVER WEST
156	DOVER EAST
157	WALPOLE
158	GILSUM
160	STODDARD
161	HILLSBORO
163	WEARE
164	GOFFSTOWN
165	MANCHESTER NORTH
166	CANDIA
167	MOUNT PAWTUCKAWAY
168	EPPING
169	NEWMARKET
170	PORTSMOUTH
171	KITTERY
172	PUTNEY
173	SPOFFORD
174	KEENE
175	MARLBOROUGH
176	DUBLIN
177	PETERBOROUGH NORTH
178	GREENFIELD
179	NEW BOSTON
180	PINARDVILLE
181	MANCHESTER SOUTH
182	DERRY
183	SANDOWN
184	KINGSTON
185	EXETER
186	HAMPTON
188	BRATTLEBORO EAST
189	HINSDALE
190	WEST SWANZEY
191	TROY
192	MONADNOCK MOUNTAIN, NH
193	PETERBOROUGH SOUTH
194	GREENVILLE
195	MILFORD
196	SOUTH MERRIMACK
197	NASHUA NORTH
198	WINDHAM
199	SALEM DEPOT
200	HAVERHILL
201	NEWBURYPORT WEST
202	NEWBURYPORT EAST
203	NORTHFIELD MA
207	ASHBURNHAM
208	ASHBY
209	TOWNSEND
210	PEPPERELL
211	NASHUA SOUTH
212	LOWELL

September 2008

Contact Information:

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U.S.G.S. Geologic Mapping Program Office
Program Coordinator: Randall Orndorff (703)648-4316
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I do not have anything to report on western NY, but I have a new paper going to press this month. It is the result of my sabbatical research while in the Netherlands. I conducted a study on the fluvial response of the Rhine River to Lateglacial to Early Holocene environmental change. The citation and abstract are below. I can also supply reprints to interested parties on request.

Autin, W., J., 2008, Stratigraphic analysis and paleoenvironmental implications of the Wijchen Member in the lower Rhine-Meuse Valley of the Netherlands: Netherlands Journal of Geosciences, v. 84, p. 291-307.

ABSTRACT

The Late Pleistocene Wijchen Member (WM) and its informal stratigraphic precursors have been recognized for decades in the Rhine-Meuse Valley of the Netherlands. Although the WM marks the top of the Kreftenheye Formation (KF) at the boundary between Pleistocene and Holocene lithofacies and provides a confining bed for the regional alluvial aquifer, significant issues remain regarding WM depositional environment and processes of sedimentation. Regional WM chronology suggests a time-transgressive, millennium scale response of the Rhine River to Lateglacial climate oscillations. This paper compares interpretations of sedimentation process, stratigraphic pattern, and paleoenvironmental significance to prevailing viewpoints on the WM mode of origin.

A flood basin in the Over Betuwe between the channel belts of the Neder Rijn and River Waal is investigated to characterize WM stratigraphy. The KF braided stream deposits (Kb) form a regionally extensive sandy to gravelly lithofacies. As Kb aggradation ceased, fluvial channels incised into local braid plain swales. The WM was deposited during episodes of fluvial activity as a suspended load mud drape across segments of the abandoned braid plain. The WM is a gray silty lithofacies that also contains local admixtures of sand. Explanations for the origin of the sand admixed into the mud include variability in hydrodynamic load across the flood plain, eolian mixing, and/or biogenic mixing. In the study area, eolian deposition of sand onto a wet flood plain surface is the most probable cause for the admixed sand fraction. Pedogenesis of the WM in the study area is limited
to gleying under reduced wetland conditions and the development of organic rich vegetation horizons that formed on top of relatively unaltered fluvial strata. Similar reduced soil properties and limited pedogenic development occur downdip to the present coast, but updip of the study area, the WM is the parent material for poorly drained to well drained and oxidized profiles that range from Entisols to weakly expressed Alfisols.

The presence of pumice granules in Kb deposits of the study area indicate that channel belt deposition continued after the Laacher See volcanic eruption in Germany at ~12,900 cal yr. Deposition of the WM occurred episodically throughout the Lateglacial and terminated by the early Holocene. The time interval between the end of WM deposition and subsequent burial by flood basin peat reflects a duration of exposure of at least 3500 yrs. Since regional water table rise

affected the area ~5000 cal yrs ago, the early Holocene water table must have been maintained by spring fed ground water sources from nearby ice pushed ridges.

Deposition of the WM is associated with transitional braided to meandering fluvial channels during times when the Rhine-Meuse Valley experienced a sensitive response to rapid climate change. The WM is regionally time transgressive and probably formed during flood plain transitions between permafrost and base-flow driven hydrologic regimes. Regional landscape dynamics suggest that WM deposition and subsequent preservation was driven by fluctuations of the southern limit of permafrost during Northern Hemisphere deglaciation.
****

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As part of PA's STATEMAP program, I'm returning to north central PA just south of the NYS state line this spring to revise the Surficial Deposit (glacial deposit) maps of the Jackson Summit and Mansfield 7.5′ quads. We first mapped that area in 1986 and it was made available as part of the Wellsboro 1:100,000 scale PAGS open file report. At that time PAGS wanted to limit the number of Surficial Deposit units on the map so we did not break out the proglacial lake sediments as a separate unit nor separate glacial outwash from Holocene alluvium on the valley floors. There were extensive, deep, and long lived proglacial lakes in the north draining Cowanesque and Tioga valleys and wide spread varve deposits. The hillslopes exhibit abundant slump and slide scars. The new PennDOT visitor center on US 11 (future I-99) is beginning to slump downslope. So now we are to focus on the varves to map out their area distribution, thickness, and slump-slide landforms. The varves are covered by colluvium from higher on the mountain sides in most areas and are only exposed in valley side slumps. So we will be coming up with composite map units such as colluvium underlain by varves, glaciofluvial underlain by varves, and alluvium underlain by varves. We will have 2 feet vertical resolution LiDAR imagery to do a detailed delineation of all slump-slide slope failures. We may have to have more detailed maps at scales of 1:12,000 or 1:6,000 for areas of closely spaced and complex geometry failures. The new mapping will be produced in ArcGIS and will be available in ArcGIS or PDF formats on the PAGS website by the end of 2009.
****

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We continue to conduct stable isotopic studies of Champlain Sea foraminifera in our investigations of its salinity history, its relationship to glacial lake drainage from the west, and North Atlantic Ocean circulation. Stable isotopes in benthic foraminifera are increasingly used to understand glacial and deglacial hydrography around continental margins of North America and Europe.

Champlain Sea species now under study are *Cassidulina reniforme*, *Haynesina orbiculare*, *Islandiella helenae*, *Elphidium excavatum clavata*. Work is conducted in collaboration with many colleagues, J. Rayburn, D. Franzi, P. Knuepfer, R. Thunell, J.-P. Guilbault, P. Manley among others. Emphasis is on material from New York, offshore in Lake Champlain, and parts of Canada. Latest results will be presented at the AGU meeting in December 2008.
****

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Canada

A group of us at the Geological Survey of Canada (myself, Dave Sharpe, Hazen Russell, Susan Pullan, Andre Pugin, Jim Hunter, Marc Hinton, Sam Alpay) have been working on a high-yield esker aquifer in the Champlain Sea basin just east of Ottawa using a large, integrated dataset. The seismic data are fantastic, the cores are spectacular, and the outcrops are world-class. Some results support popular ideas of how eskers form, while others question long-held assumptions. Please join us in June 2009 in Ottawa as we host the annual Friends of the Pleistocene fieldtrip.
****

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Greetings from eastern Rensselaer County!
RPI NEWS; Recently, I joined the RPI faculty to teach their Field Methods course for the fall term. The small class ventured out on many trips with a lot of glacial focus. Independent projects for pairs of students include 2 of glacial interest. One pair of students is working on the Corinth Road stratigraphy, hoping to examine more than has been seen before and attempt to piece together a story. They have followed up on an observation during the NYSGA trip that a sandy diamicton may be a crevasse fill, armored at the top and linear in shape. Another pair of students is working on the Lock #1 exposure of deep lake sediments. The puzzle there is a thick massive fine grained unit bounded by rhythmites.

NYSGA TRIP; That NYSGA trip was a good event with participants getting to see the work of my class on freshening the Corinth Road exposures a few weeks earlier. We also managed to visit the upper and lower exposures of the Street Road delta and a fine exposure in the Glen Lake kame moraine. There was plenty of good discussion and even some booty brought home from one location!

FOP TRIP; The NYSGA trip complemented the FOP trip I organized and ran with Gary Wall, Norton Miller, John Rayburn and Andy Kozlowski. The 3-day event took us from Brandon, VT, through the upper Hudson Valley to the outskirts of Troy. Please see both the NYSGA and FOP trip guidebooks for full details. I have some copies of the FOP guidebook available.

THIELLS QUAD MAP; Surficial mapping of the Thiells quad for Andy at the NY Survey reveals the lowlands east of the Ramapo Fault are quite a drumlin field. While no striations were observed in the lowlands, the streamline molded terrain largely consists of a drumlin field with rock drumlins atop some of the slightly higher terrain. An immature trellis drainage network has incised the drumlin field. Drumlin axes indicate the H-C ice lobe flowed generally south to southwestward through the lowlands. Overall, the pattern of ice flow through the entire quadrangle represents divergent flow of the H-C ice lobe as it spread southwestward toward the New Jersey border.

Thick till could easily be distinguished from thin till. This distinction was fairly readily accomplished in the field because the thick till of the drumlins has a surface with almost no erratics and farming over the centuries has brought up few erratics from the subsoil. Indeed, exposures of this till seen at several places revealed a silt rich compacted lodgement till with many small clasts but only occasional large clasts. Due to the red bed source of much of the till sediment in the lowlands, the soils seen contained 10R dusky red to 2.5YR dark reddish brown and reddish brown colors. Subsoils were more 7.5YR strong brown to brown colors. Thin till areas contained occasional or frequent rock outcrop but also were liberally littered with erratics at the surface. Plowing has turned up many more large clasts and these subangular to angular boulders dominate the stone walls lining the narrow roads.

Ice contact topography was only weakly developed, subtle in its hummocky nature. The surface sediment is only slightly sandier in texture than nearby till. However, the borings along the best developed area near Mt. Ivy Swamp verify several tens of feet of mixed fluvial and diamicton sediment appropriate for these limited kame regions. Much of the Mt. Ivy Swamp deposits have been removed and likely spread nearby to elevate portions of the swamp for commercial development. Minor outwash sand with lesser gravel was mapped in the down valley direction from a few of the kame areas. Together, the kame and outwash areas indicate retreatal positions of the H-C ice lobe and may be positively correlated to ice margins recognized in adjacent quadrangles. Correlations will be attempted in a later phase of study. The Thiells quadrangle ice marginal sediment may be only weakly developed but past mapping efforts have not recognized any ice contact deposits across the quadrangle.
****

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I retired from PennDOT in September, 2008, and have been focusing on projects in NYS that I want to follow up on. My primary effort will be revisiting various problems in the glacial stratigraphy of eastern NYS, particularly the age of the Lake Albany sequence and evidence for free drainage through the Hudson Valley during the Erie Interstade. I've begun this effort by scanning notes from my work with the NYS Geological Survey. I've scanned 113 7.5-minute quadrangle maps compiled from 1969 to 1986. The notes are based on surficial mapping, descriptions of (long defunct) exposures, examination and interpretation of airphotos and topographic maps, and subsurface data, including well, test boring, and geophysical logs. The data quality on the maps reflects the time spent on a quadrangle, which in turn reflects the purpose of

the mapping. Mapping that was conducted to be published on the 1:250,000 series of surficial maps was generally completed in a short time frame. Mapping that was conducted to clarify the glacial stratigraphy of the northern Hudson and eastern Mohawk lowlands was completed over a longer time interval. Mapping for groundwater studies was generally conducted in an intermediate time interval. The quadrangle folders contain one or more of the following: topographic map, ice movement indicators (drumlins, flutes, and striae), surficial geologic map, exposure descriptions, wells, bedrock topographic data, pit locations (based on field observations and airphoto interpretation), exposure locations, and assorted notes.
****

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In conjunction with Andy Kozlowski (NYSGS) and my graduate student Matt Gentoso (B.S. PSU) I am starting a new project in New York State. We plan to use a paleomagnetic technique (AMS) and traditional clast macrofabrics to investigate till kinematics and streamlined bedform development in the Weedsport drumlin and flute field of central NY. Details are available upon request.
****

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Research at Bering Glacier, Alaska was initiated in 1988 after Ernie Muller (Syracuse University) and Don Cadwell (NYSGS) and I came across a moraine consisting of lake sediments in the vicinity of Batavia, NY and wondered how does something like this happen. We chose the Bering Glacier as a modern analog for a broad, temperate glacier with a peripheral drainage system, much like the Laurentide Ice Sheet.

For its 21st consecutive field season, the Bering Glacier Research Group (based at SUNY-Oneonta) identified four primary objectives for investigation along the eastern sector of the Bering piedmont lobe, two of which relate to the influence of climate and weather and two deal with Neoglacial foreland stratigraphy. Three additional secondary objectives were designed to monitor ongoing, ice-marginal processes, thus advancing our current database while anticipating future potential research opportunities. These focused on ice-contact lake bathymetry, upwelling ice front vents, and the physical properties of meltwater. Renewed efforts to detect buried forest horizons using Ground Penetrating Radar (GPR) continued work initiated in 2006, and this year studies began to determine re-vegetation patterns on terrain uncovered by retreat following the mid 60's and early 90's surge events.
****

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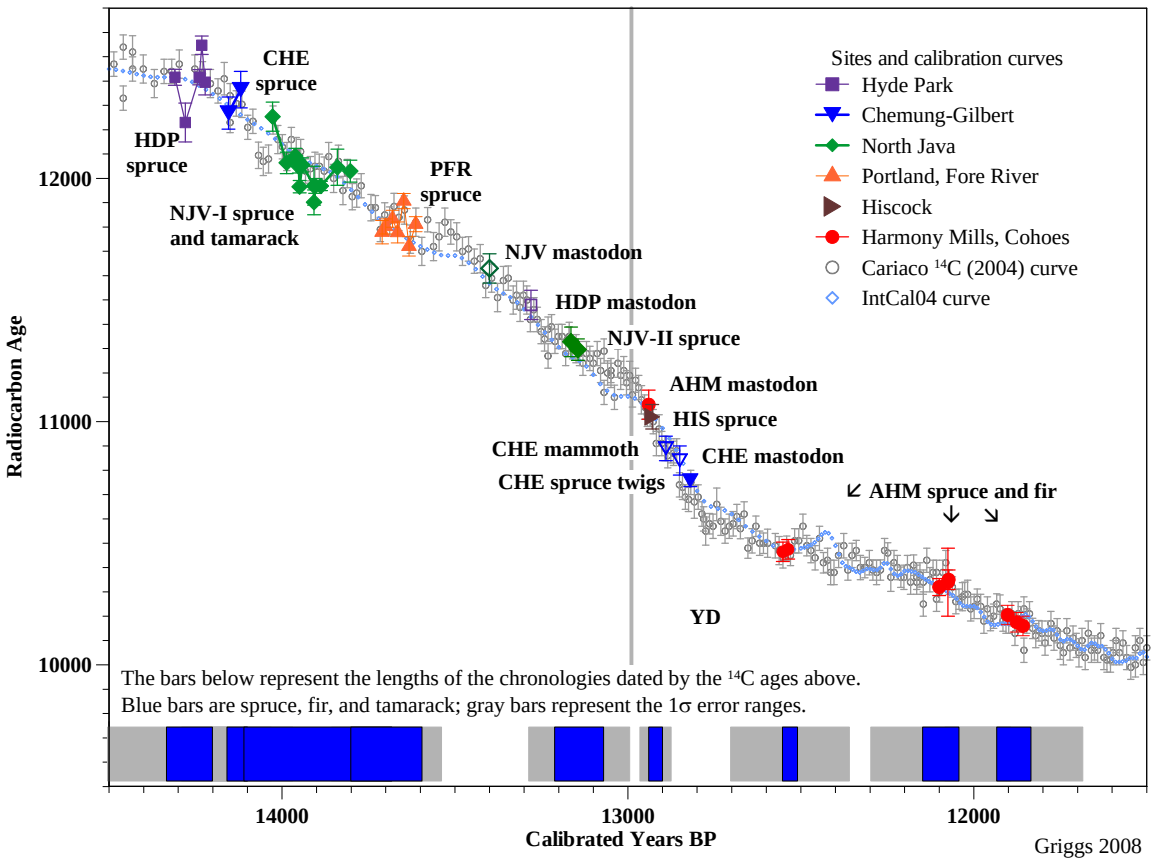
Update on "Pleistocene to Present Dendrochronology Project in Upstate New York" (now extended to NE North America)

The project currently is focusing on finding Late Glacial wood, aiming to help fill in the terrestrial radiocarbon record, particularly for the early Younger Dryas. Recent collections include 70 samples from logs buried in Bell Creek near Fulton, NY, most from underneath the level where we found one fir log dating to 8191±28 ^{14}C BP (Hd-26286). Most of the new samples are spruce, and I am building chronologies from those and will send samples for more radiocarbon dates. At least some should date back into the Late Glacial.



The figure shows the dates from five mastodon sites, plus the Portland, ME, site that I worked on with Woody Thompson and Norton Miller (NE GSA meeting 2008). I am looking forward to being out in the field this summer to dig up some more - if anyone finds buried wood in their field work, please let me know!

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I recently slipped into Jay Fleisher's position at SUCO (Fall 2007—has it been a year already?!). I can not hope to fill Jay's glacial (snow) shoes—I am more of general geomorphologist who explores those processes in my backyard that move mass around in the landscape. This first year I have initiated a flood mapping project to document the devastating June 2006 flood event in Otsego County; together with SUCO archaeologists, I probed the Pine Lake campus flood plain with ground penetrating radar to get a better idea of floodplain architecture and focus future digs; and I spent a good deal of time exploring the glacial features in central southern New York, mostly in the virtual world of digital elevation maps and digitized geologic and glacial geology maps. As a newcomer to this part of the country, it has been extremely useful to mine the NYSGA guide books for maps that I can overlay onto a DEM. I find myself drawn to the somewhat puzzling landforms in the uplands of Otsego County, namely, the scattered narrow bedrock gorges, odd mounds and divergent flow paths (not the highly integrated dendritic fluvial networks I am accustomed to!), rock basins

and asymmetric drainages. I intend to work on some of these puzzles in the future. We have a new Mala GPR system with a 100 MHz and 500 MHz antenna, a new GSSI handheld electro-magnetic induction profiler, a new reflectorless total station, Magellan Promark 3 GPS receivers for post-processed positioning, and a handheld Raman spectrometer for mineral identification (the Rock Hound). We are happy to share tools and expertise!
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Hello Quaternary Geologists of New York! I am a Ph.D Candidate at UB working with Jason Briner in the Department of Geology. We currently have several exciting projects in NY coming to fruition now that I am hitting the "home stretch". We recently submitted an exhaustive GIS study of drumlin morphometry to Earth Surface Processes and Landforms. Using a spatial predictive model, we developed a surface of subglacial bedform elongation (length/width) for the entire NY Drumlin Field. Our results illustrate multiple zones of fast ice flow within the Laurentide when it occupied present-day NY. We suggest two possible mechanisms by which the fast flow documented in the landform record may have been promoted: 1) topographic funneling of ice into deep troughs such as Seneca and Cayuga and 2) the development of significant calving margins along the southern margin during deglaciation. Keep your eyes peeled for the final product. In addition to the morphometry work, we have been working with John Menzies at Brock University on microstructural, fabric, and stratigraphic analyses of sediments found within NY

drumlins. I am currently visiting Brock where John has established an outstanding micromorphology lab. Over the coming months we will be testing multiple hypotheses of drumlin formation using the vast quantity of data collected in the NY field. Stay tuned as we address the *drumlin question*.... Lewis Owen from the University of Cincinnati joined us in the field this summer to collect samples for OSL dating. We gathered sediments from several LIS-marginal deposits along with some beautiful dunes from the east end of Oneida Lake where we were joined by Eugene Domack from Hamilton College. Results should be in very soon and we hope to continue sampling once our first round of measurements is complete. I plan to travel to Ireland in March where the results of our drumlin work will be presented at the VII International Drumlin Symposium. Several of you attended the subglacial bedform theme session convened by myself and John at the 2008 NEGSA meeting in Buffalo. There has been some preliminary talk of holding the VIII Drumlin Symposium in NY (possibly as soon as 2011), but no solid plans as of yet. I'll provide an update in my next Glaciogram entry.
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Most of the work alluded to in my last submission in 2004 has been published. The papers Mike Lewis and I edited from the Great Lakes conference (IAGLR) held at Waterloo in May, 2004 were published in a special issue of Journal of Paleolimnology (37, 2007). My Quaternary geology report on the Brampton area became Ontario Geological Survey Report 257 (2005). Alluvial fans on the Lake Iroquois terrace at Scarborough (Toronto) yielded molluscs, vertebrates, and ^{14}C dates (6000-10000 BP) and a paper with RICHARD MEYRICK appeared in Palaeo3 (243, 2007). Algonquin-Nipissing shorelines at North Bay appeared in one of two special issues of Geographie Physique et Quaternaire in honor of Vic Prest (58, 2006). Algonquin shorelines of the Sudbury basin were described with ANDY HEATH in the Journal of Great Lakes Research (33, 2007). The oldest dated glacial lake site in Ontario (13100-13400 BP) at Leamington, with Mollusca, Ostracoda, plants, Coleoptera, Trichoptera, Chironomidae, Turbellaria, and fish, was described with MORRIS, MCANDREWS, MORGAN, SMITH, and WALKER in Canadian Journal of Earth Sciences (44, 2007). A paper with LEWIS, BLASCO, MCCARTHY, KING, MOORE, and REY reviewed Huron basin lake history in Aquatic Ecosystem Health and Management (11, 2008). Of more interest to New York readers is a paper with MACKIE on mollusc assemblages of the Hyde Park and North Java mastodon sites, published by the Paleontological Research Institution in Paleontographica Americana (61, 2008). This volume is a large collection of studies on three New York mastodon sites. Following retirement in 1999, I continued teaching through 2006. My last M.Sc. student, VERENA KULAK, finished in 2005. Her thesis dealt with marl molluscs in two sites: St. Agatha swamp near Waterloo, Ontario, and Nichols Brook, New York. Work continues to finish older projects as well as newer ones. The long-running project on the Fernbank (Ithaca, New York) interglacial site is nearing the end as revision after review is being finalized with BLOOM, HAAS, HEISS, MCANDREWS, B. MILLER, MORGAN, and SEYMOUR. With RUFUS CHURCHER, a paper on post-glacial vertebrates at Hamilton, Ontario, has been

resubmitted with revisions after review. These last two, as well as an urban geology paper with JOHN CLAGUE, should appear in 2009. Newer work is on sub-till organic deposits at Zorra quarry (near Woodstock) with BAJC and BARNETT and the UW campus interstadial/interglacial with BAJC. Intermittent work at the Innerkip site continues. These sites are yielding molluscs, ostracodes, insects, and vertebrates and will move forward with contributions by YANSA, N. MILLER, CURRY, NEKOLA, MORGAN, and others. Since 2005, our museum curator PETER RUSSELL and I have been involved with the Highgate mastodon, said to be Ontario's most complete skeleton, and on display at the State Museum in Bismark, North Dakota. We have between us presented a dozen talks to various groups in southwestern Ontario. See Google on the Internet for more of the story. Finally, congratulations to John Rayburn for reviving the Glaciogram!
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SEARCH FOR THE LARGEST (AND OTHERWISE SIGNIFICANT) BOULDERS IN THE NORTHEAST

Lee Wilder and I (both at the New Hampshire Geological Survey) have been inventorying and collecting information on record-size or otherwise notable boulders in New Hampshire. As an extension, we have been listing large and significant boulders in other states as well. We would like to hear about any superlative boulders in New York State. Some may be glacially deposited boulders, including erratics. Others may be talus blocks that have fallen from cliffs or mountain sides, or accumulations of colluvial blocks in valleys. It is likely that most, if not all, of the largest and most interesting boulders will have a glacial origin to at least some degree.

We would appreciate any information of notable large New York rocks, including their location, approximate dimensions, intactness, and mode of origin (if known). We will compile a list with a tentative size ranking and forward it to the GLACIOGRAM where it can be referenced and updated from time to time. Information about significant boulders from elsewhere in the region (New England and nearby Canada) is also welcome.

Rocks that are important for reasons other than size are also of interest. This includes historically significant boulders (or rocks) or simply those that are unusual in their physical attributes (boulders harboring caves, balanced rocks, sculpted rocks, compositionally interesting boulders, natural likenesses, etc.).

By the way, to begin the quest, currently the largest identified boulder in the northeast (New York and New England combined) appears to be the Madison Boulder in the Town of Madison, Carroll County, New Hampshire. This is a NH State Park Natural Area and information on this boulder is available at: http://www.newhampshire.com/state-parks/madison-boulder-natural-area.aspx
Do you know of any competitive candidates?
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Greetings to all and thanks John for bringing back the Glaciogram. On-going 1:24,000 mapping in Onondaga County continues. The goal is to complete the county and create a more extensive Quaternary report connected to the various hazard, land-use, groundwater, and glacial geology studies now underway by my hardworking colleagues Bill Kappel and Andy Kozlowski (reported elsewhere in this *Glaciogram*). Be sure to download the latest set of Bill Kappel authored USGS Fact Sheets. They provide a great overview of the work completed since our 2005 FOP trip.
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At LDEO, we are continuing our investigations into Alaskan muskegs around the Gulf of Alaska. We are working on sites near the Bering Glacier and Kodiak Island, as well as sites on the Kenai. Miriam Jones, just completed her dissertation entitled *"Climate and vegetation history from late-glacial and Holocene peat from the Kenai Peninsula, Alaska: a record of pollen, macrofossils, stable isotopes, and carbon storage"*. Three papers from the thesis are in review, and Miriam is enjoying a postdoc at Lehigh University this fall with Zicheng Yu.

A second objective is the continued investigation of the climate, watershed, and human impact history recorded in the Hudson River marshes. We are working on pollen/macrofossil stratigraphy from Jamaica Bay, Staten Island, Piermont, Iona, and Croton as well as other sites. Sanpisa Sritrairat, a Ph.D student, is examining the history of Tivoli Bays and Stockport Flats, as well as performing elemental analysis using a hand-held x-ray fluorescence analysis (XRF) instrument in collaboration with our LDEO geochemist colleague Tim Kenna.

A third major objective is a documentation of the timing and environment of the retreat of the Laurentide ice sheet across southern New York, New Jersey, and Connecticut. We have over 12 new lake/bog sites which we are examining for plant macrofossils in the lake clays. We find several sites with tundra remnants (Dryas, dwarf birch, arctic willow) and some sites in which spruce needles record the initial plant colonization after ice retreat. In collaboration with Kirsten Menking (Vassar) we are examining plant macrofossils from Lake Mohonk. Other sites from the Hudson uplands such as Rhododendron Swamp (Mohonk area) and Sutherland Fen (Black Rock Forest – collaborating with Terryanne Maenza-Gmelch) are giving us a rich record of plant macrofossils as well as pollen throughout the Holocene.

Fouth, we hope to continue to collaborate with Norton Miller on the King's Gap Pond site with Helen Delano (Pennsylvania Geological Survey, Middletown) and Noel Potter, Jr. (Dickinson College, Carlisle, PA) as well as Guy Robinson on Orange County sites.

Finally we continue to count pollen from wetland sites near the eastern edge of Lake Ontario (Juniper Pond, South Sandy) where Matt Distler (Ph.D student with Don Leopold) has produced late-Holocene macrofossil stratigraphies.
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I am in my second year at SUNY New Paltz, and I am very grateful to be back in New York State! I have been busy teaching Geology classes, as well as classes for New Paltz's new Environmental Geochemical Science program. Besides assisting with this year's NE-FOP trip with David De Simone and others (see David's Glaciogram contribution), I have also been continuing my work in the Champlain Valley with David Franzi, Tom Cronin, and a host of others (see Tom's Glaciogram contribution). This past semester I began two new projects. One in collaboration with David Barclay (SUNY Cortland) constructing a recent tree-ring chronology in the Champlain Valley using both trees and historic buildings. The other in collaboration with Tara Curtin (Hobart & William Smith) and SUNY New Paltz geology student Lacy Folga, on lake level changes in Seneca Lake. (Look for Lacy's poster at NE-GSA.) Finally, I'd like to thank all the contributors to this first *New York Glaciogram* volume published from SUNY New Paltz.
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I have been writing columns for Kaatskill Life magazine, the Columbia County Independent, the Greenville Press and the Woodstock Times. I routinely do a large number of articles about local ice age topics. I will be doing several columns on Glacial Lake Woodstock, as well as numerous articles about the ice age record of the Hudson Valley. I will be doing a field trip, describing the ice age geology of North Lake State Park for the 2009 NYSGA. All of his writing is directed at the general reading audience and none of it should be considered "professional" writing or part of the scientific canon.
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Thanks to John for continuing the Glaciogram! During recent years I have been working on lake, reservoir and watershed management plans, erosion control evaluations, landslides and other projects that link to glacial geology in southwestern New York. I continue to look at the relationships of subsurface information to glacial history and ground water and surface water conditions. Some of the work can be found at www.fredonia.edu/org/waternet
This web site includes results from our projects with the Chautauqua County Health Department, including our monitoring of water quantity conditions and droughts since 2001.
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