VOLUME 37, NO. 1 • Spring 2002

NEW YORK GLACIOGRAM

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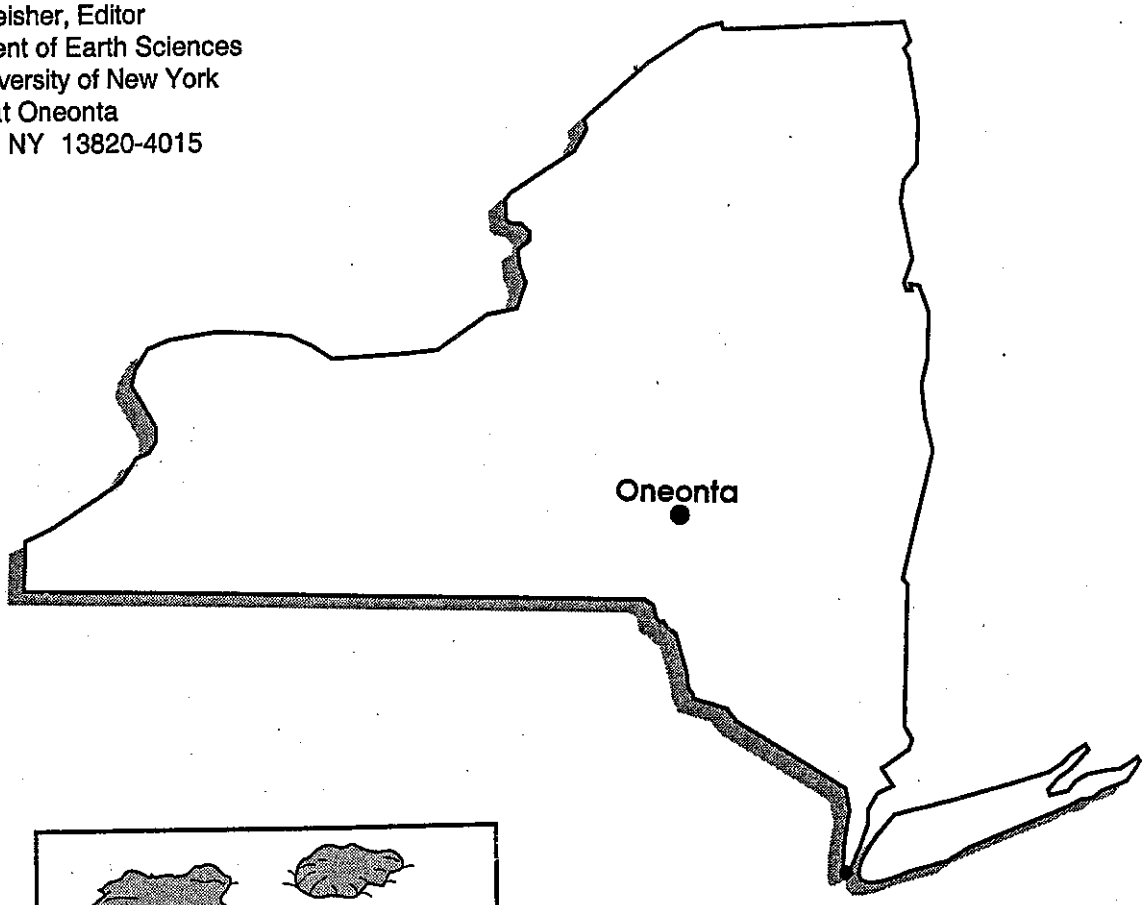

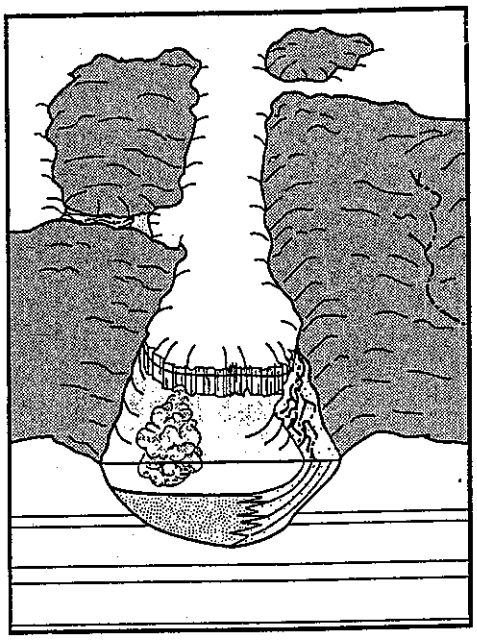

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EDITORIAL POLICY

The **GLACIOGRAM** is intended to be a 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.

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INVITATION FROM THE EDITOR

As you may know, the **Glaciogram** contains volunteered notes and project summaries. As the title implies, past issues have contained entries weighted toward Glacial Geology. Perhaps it's time to 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., but to date have not yet been included. Should your area of interest fall within this broader realm, please consider having your work included in the spring edition by forwarding a brief (300-500 words or less) summary at your convenience. Easily duplicated, simple, line diagrams and map figures (sorry, no photos) may also be submitted. Please pass this invitation on to friends and colleagues who may wish to share their work or be placed on the mailing list.

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Announcement:
67th Annual field Conference of PA Geologists
Bedrock, Surficial, Economic, and Engineering
geology of the "Endless Mountains" Region,
Susquehanna and Wyoming Counties, PA

October 3 - 5, 2002

Headquaters: Shadowbrook Inn and Resort, Tunkhannock, PA.

I'm one of the leaders and we will be examing a couple of exposures of the glacial deposits in the Great Bend area just south of the NYS line.

I'm also thinking about a pre-meeting trip on Oct 3 for Quaternary types looking at evidence for Glacial Lake Great Bend and evidence against catastropic floods down the Susquehanna in the Tunkhannock area.

The evidence for Glacial Lake Great Bend requires hikes up rugged valleys that are not appropriate for the large groups that usually attend the conferernce. So if I get 10 to 20 people interested in slogging through some downed timber and the such to look at slippery varve outcrops I'll run a 1/2 to 1 day trip just looking at the glacial stuff on Thursday, Oct. 3. If any glaciogram types are interested, please drop me an email. If I get enough responses I'll definitely work up a trip.

As for our on-going mapping of glacial deposits in NE PA, we finished the Tunkhannock to Carbondale area last summer and will do the area SW of Tunnkhannock this summer.

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Surficial mapping this summer will extend the completed 7.5' mapping in Onondaga County eastward to the Oran or DeRuyter quads. The surficial and bedrock quad data is being GIS'd and we've draped the units on a DEM mosaic. I'm part of a NC/SE GSA symposium this week in Lexington, KY on using images like DEMS to advance our glacial geomorphic-based arm waving. I'll have a DEM of Onondaga County up at the Map 'Blast'. Anyone else doing this kind of work with NY landscapes ? I'd love to hear from you.

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Here is a note that relates glacial geology and groundwater from our recent work in the Oak Ridges Moraine. I have attached one figure and a second will follow (both can be reduced to ~3 cm high). Trust that this is ok.

The importance of glacial geology and sedimentology to groundwater studies has been highlighted in our recent work on the Oak Ridges Moraine north of Lake Ontario. Study methods are summarized below from a recent paper in Geoscience Canada. Recent publications and project details are listed on:

Oak Ridges Moraine website: http://sts.gsc.nrcan.gc.ca/orm/index.asp

The importance of glacial geology and basin analysis to groundwater management

To manage groundwater resources in a sustainable way in northern climates there is a need for regional knowledge of glacial aquifer systems. Improving regional knowledge, in light of scant hydrogeological data, requires a multidisciplinary approach that advances the geological understanding of a basin. Basin analysis - mapping and characterizing the reservoir potential of sedimentary basins as applied in petroleum exploration - provides an approach that is directly applicable to regional hydrogeology studies and related land use planning. Our recent work applies basin analysis to a glaciated terrain by integrating data from a variety of sources and scales of investigations to develop a hydrogeological model of the Oak Ridges Moraine Area (ORM), southern Ontario.

Basin analysis supports the progression from data compilation and geological conceptualization to model development, and ultimately, towards quantitative flow system analysis (Fig. 1). This is achieved notably by developing primary geological models of the stratigraphy, sedimentary architecture and origin of deposits of the ORM area. The analysis outlines two regional elements highly significant to groundwater flow in the area: i) dissected regional till uplands that form the principal aquitard, and ii) channels that breach the till and form hydraulic windows and important channel-fill aquifers. The important channel aquifer setting had not been previously recognized because its identification required a geological framework (Fig. 2) based on high-quality topographic, geological and geophysical data. Development of the regional geological knowledge would not have been possible using relatively poor-quality water well records alone.

The watershed approach that is embodied in basin analysis strongly enhances communication between geoscientists and engineers, planners, and other scientists. Better understanding of regional hydrogeological settings also will improve the scientific basis for land use planning. Site remediation or development proposals generally rely on site-specific data and analysis, often restricted to shallow depths and predominantly for the purpose of site design. Such studies will benefit from regional knowledge of hydrogeological settings and the extent of flow systems beyond the site to watershed or basin scales. Accordingly, in our work we advocate investment in both high quality data and the regional approach that underlies basin analysis, thus permitting a much more accurate assessment of specific groundwater issues in complex hydrogeological settings found in Ontario and adjacent Great Lake states such as New York.

1. Simplified basin analysis approach used in the regional hydrogeology analysis of the ORM glaciated terrain. The approach leads progressively from data base development early in a study to quantitative understanding of groundwater flow systems as the study matures.

2. Stratigraphic framework of the ORM study area. The stratigraphic architectural model consists of five stratigraphic units (Paleozoic bedrock, Lower sediment, Newmarket Till, ORM and channel sediment, and, Halton Till) in addition to two unconformities. Lower sediment groups a number of formal stratigraphic units.

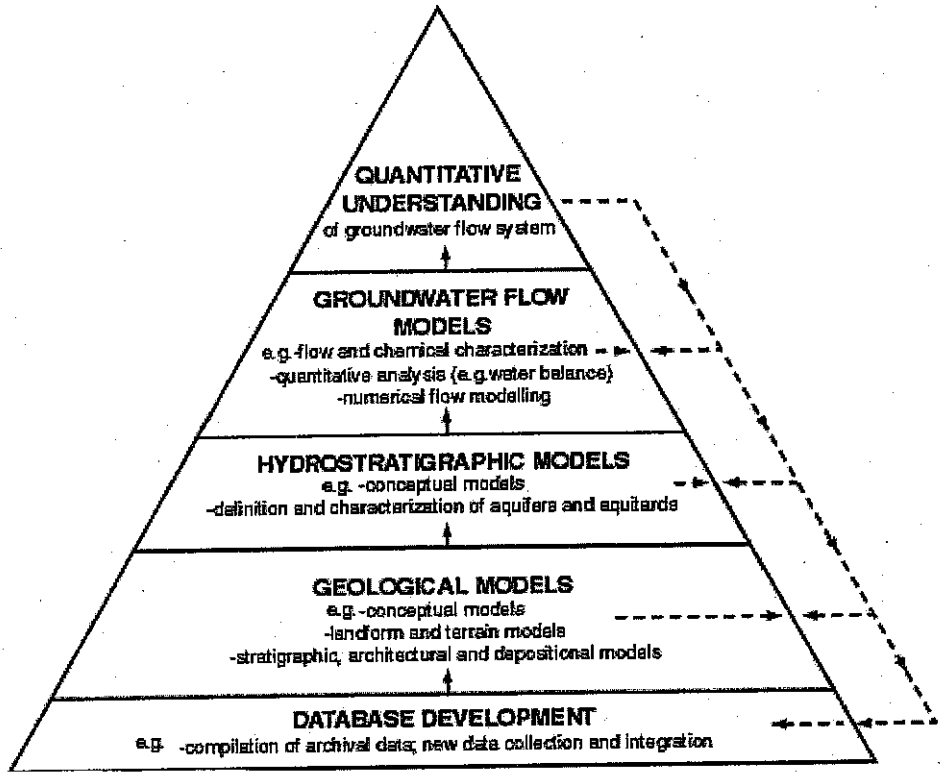


Figure 1

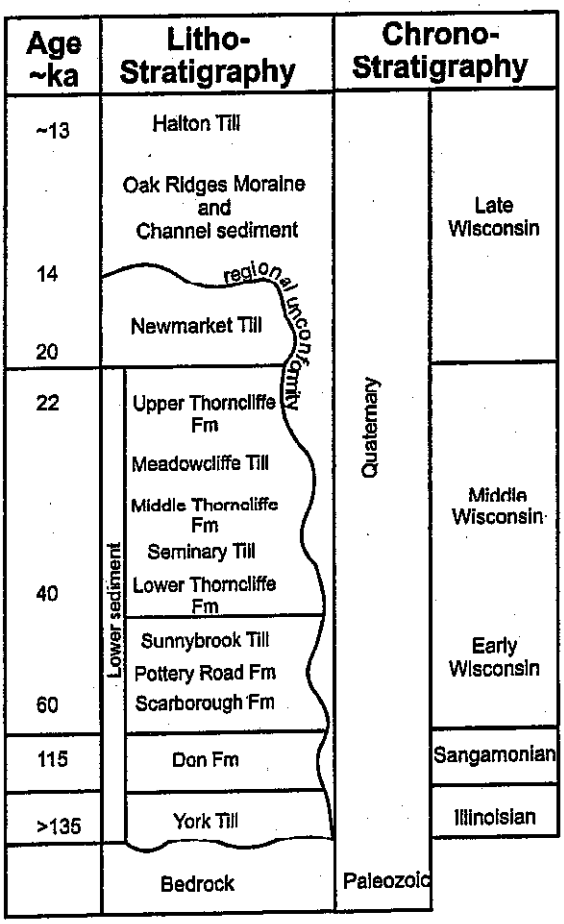
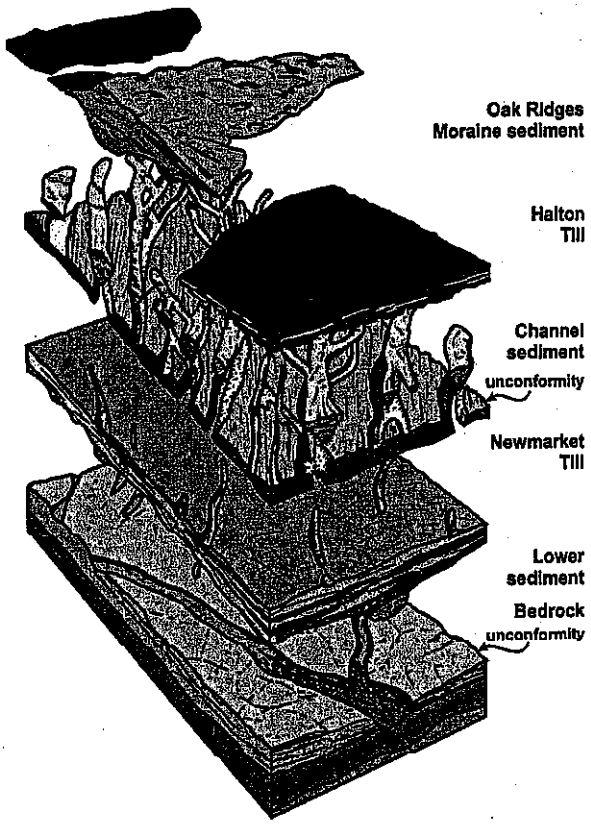


Figure 2



Paul Karrow, Department of Earth Sciences, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, Canada N2L 3G1; phone 519-885-1211; FAX 519-746-7484, <pfkarrow@sciborg.uwaterloo.ca>

While away to GSA in Burlington, VT and Florida in March-April 2001, I missed the submission deadline for the Spring 2001 Glaciogram, and missed the fall 2001 submission date as well.

Samples of organic sediment from the small supplementary exposure at the Scout Camp north of the Fernbank interglacial site visited with ART BLOOM in June 2000 yielded coniferous pollen (JOCK MCANDREWS, personal communication). This is consistent with their height above the lake, suggesting equivalence to the upper part of the Fernbank section. Although containing wood, it was felt it would be too old to date, like Fernbank upper wood (>50 ka). Circumstances have forced JUNE MIRECKI, formerly College of Charleston SC, to discontinue amino acid analysis of mollusc shell from Fernbank and Toronto and she has passed samples on to RICK OCHES, University of South Florida, Tampa FL, to finish the work. This will be the fourth amino acid specialist to be involved with this project over a 35 year period.

At NE GSA in Burlington VT, RICHARD MEYRICK and I gave a paper on terrestrial molluscs in an alluvial fan at Scarborough Bluffs on the Iroquois terrace. After my presentation and in subsequent e-mails I was invited to participate in the group project on the Hyde Park mastodon in the Hudson Valley of eastern New York. My part will involve the molluscs in underlying marl. M.Sc. student VERENA KULAK is also likely to be involved, as well as in a swamp marl near Waterloo, which was probed in the summer of 2001 to construct a cross section -- it is 1.5 m of muck and peat over 3.6 m of marl with a basal plant layer, generally on (glaciofluvial ?) sand. This site is within the Waterloo interlobate moraine.

ROGER PAULEN completed his M.Sc. thesis on the northern Ontario Timmins area, dealing with glacial Lake Barlow-Ojibway and the Cochrane advance -- last known (8 ka) before rapid decay of the Laurentian ice sheet. STEVE DOUGLAS is pushing to finish his M.Sc. thesis on the Fort Erie area.

Samples from the Bondi pit, Leamington Ontario, collected in 1988 and 1995, are being analyzed for fossils to supplement the Morris et al. (1993) paper on muskox and plants (CJES 30, 2436-2447). Dates (wood, bone) at this site are 13.4-13.1 ka, the oldest dated postglacial site in southern Ontario. The paper mentioned molluscs, now being picked and identified; these are accompanied by abundant ostracodes.

Participation in the October Smith Symposium II will lead to a site visit in the summer of 2002; I am particularly interested in the basal (glacial ?) sediments at the site.

In the summer of 2001, I did reconnaissance in the Bruce Peninsula and found several surveyable Algonquin-Nipissing shorelines. Follow-up work is planned for the summer of 2002, and we hope to profile the Meaford buried valley with GPR.

In publications, the Waterloo marl mollusc paper appeared in Journal of Paleolimnology in April 2001, and the Woodbridge site paper was in the June issue of Canadian Journal of Earth Sciences. Papers accepted are the Woodstock interlobate zone quarry stratigraphy in Geographie physique et Quaternaire, a histocial geology paper for an archeology collection in the National Museums Mercury series, and a neotectonics review for Tectonophysics. ALAN MORGAN and I are writing a chapter on geology for a book on the Canadian Heritage River the Grand, of southern Ontario.

(Editor's note - My request for published and unpublished radiocarbon dates is a tall order for a number of regional researchers. Hank Mullins (Syracuse and Paul Karrow (Waterloo) had very similar comments suggesting that my request may be a tall order for those with decades of information.)

Paul Karrow offers the following:

As my records go back 45 years and I'm not sure I have any dates from New York State anyway. However there are three very nearby that should be mentioned. One is well known and often cited, the other two, more recent, were published in an AMQUA abstract in 1990 but not widely known. All three are from the St. David's buried valley near Queenston and from similar depths with similar ages. They are:

GSC-816 22,800+_450, depth 150 feet.
BGS-1394 25,800+_500, depth 43.6 m.
TO-1595 24,790+_190, depth 44 m.

Additionally, in Steve Douglas' thesis are four unpublished dates under 10,000, but we are not ready to make them available yet.

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As my colleague Matt Lachniet put it, "it's amazing how much work one can generate from a few weeks in the field." He was referring to a manuscript that is currently in review dealing with macro-scale and microstructural evidence of deformation with till and related sediments beneath the surging Bering Glacier. This paper summarizes our poster (with Matt Lachniet and Ernie Muller) to be presented at the Fast Glacier Flow Symposium, Yakutat, Alaska, scheduled for June 10-14, 2002. This will be followed by two weeks back on the eastern sector of the Bering piedmont lobe where we will continue to map and document the rapid retreat in progress since the 1993-95 surge ended. In addition, our efforts will focus on comparing newly-exposed terrain showing the effects of having been overridden near the ice front and carved by subglacial water flow with the same terrain prior to the surge. This year the BERG field party will also include Palmer Bailey, Jim Albanese, Heidi Natel (graduate student) and two undergraduate, Richard Dworak and Tim Stewart. Fortunately, our 15-year history of field work here has the special reward of getting the before and after views of overridden terrain. This work is directly related to our long-standing attention to foreland stratigraphy, because we recently uncovered evidence of deformed fossil trees buried several meters below the surface, yet with directional indicators favoring deformation by overriding ice. Therefore, this summer we will be giving buried organic horizons special attention.

Another manuscript currently in review (with Palmer Bailey and Don Cadwell) summarizes a decade of rapid changes in the sedimentary environments along the eastern Bering ice front, with particular attention to bathymetric changes in two ice-contact lakes. We plan to repeat yet another bathymetric survey this summer.

Matt Lachniet, Ernie Muller, and I also have a week of field work planned in the Chugach foothills that stand as uplands above the 45 km wide Bering/Steller foreplain. During the past several field seasons we have found previously unknown evidence of the lateral and vertical extent of the late Pleistocene Bering/Steller/ Martin River Glacier system.

After Alaska and a brief stop back in Oneonta, I will be heading to Iceland to join Andy Russell and his group at the Skeidarajokull for a couple of weeks to compare field evidence of outburst landforms and deposits. Then I will return to Anchorage for the AMQUA Meeting in August.

Kernan W. Davis, NYS Department of Environmental Conservation, 625 Broadway, floor 11, Albany, NY 12233

As a snoopy old dog, I must tell you, here are some of my favorite things to chase:
noxious chemicals and
glaciers and
sink holes and
ground water.

But, here in New York State's Inactive Hazardous Waste Remediation Program, the trail is always cold. The ground water entered the ground years or centuries ago. The spilling, leaking or dumping of the chemicals happened years ago. The glaciers melted in millennia past. . And the sink holes formed – who knows – millennia – years – weeks ago? All these elements came together into my lap suddenly last winter.

At some time, long ago, the valley of Cayuga Lake once stood full of air, not water. And into that valley, plenty of water drained, overland and through the limestone, eroding really big caves. You can still see them, if you scuba dive along the eastern shore, near Union Springs. You can see them, via down-hole video, in the Union Springs Village water supply wells.

One can trace a swath of karst terrain features from the shore of Cayuga north-eastward to the vicinity of Owasco Lake's outlet. Do you suppose . . . ?
In the year 2000, about a week or so before Christmas, one of our hazardous waste remediation engineers approached me, asking about selecting drill hole locations, to find the source of a plume of contaminated ground water. They had observed chlorinated solvents in water drawn from public and domestic wells, drilled into deep bedrock between the Village of Union Springs and the City of Auburn, over a distance of some eight and a half miles. The highest concentrations were at the northeastern end of the data array, just outside of the city water supply district. Because there were no wells in the district, they wanted to spot locations to further chase the plume to its source.

What would YOU have suggested?

I told my colleagues to first investigate the most highly contaminated wells, in order to identify the water-bearing zones that deliver contaminants to the wells. Then, start drilling new wells, a few hundred feet away, to intercept that (or those) zones, east and northeast of the known plume (the direction in which the concentrations were higher). Then, continue in the directions indicated by the highest concentrations of contaminants.

Did they do that?

No.

They drilled a series of holes north of the plume, each situated about 5/8th of a mile from an industrial plant, formerly owned by a large, multi-national corporation. Somebody had hypothesized "they must have dumped it and they got the money to pay for cleanup." But all those wells revealed no contamination. So, we turned it over to the Federal government agents, who, following the same hypothesis, drilled more wells closer to the defunct plant. They have not released their data.

Go figure.

I plan to retire from The State on May Day. I hope to have an outdoor celebration near our office by the Hudson River, complete with May Pole Dancing. Then I will begin a new career at home with my kids, while my wife resumes her geotechnical career.

Again, and again, I have thanked you of the academic world, for uncovering more and more of the marvels and mysteries of the geological sciences, so that we, in the industrial and governmental worlds can do our work more effectively.

Thanks for the ride. Here's where I get off.

John A. Rayburn, Dept. of Geological Sciences, Binghamton University (SUNY), Binghamton, NY 13902, jrayburn@binghamton.edu, http://amadeus.geol.binghamton.edu/~rayburn/

During the first weekend in March, Peter Knuepfer and I headed up to the Adirondacks to do some coring to further explore the history of proglacial Lake Vermont. We were met in Willsboro, NY (~35 km south of Plattsburgh) by David Franzi (SUNY Plattsburgh) and Curt Stager(Paul Smith's College); there we took a vibra-core of Long Pond. Long Pond is a stratigic location for my continuing study of Glacial Lake Vermont, because it was covered by the Coveville level, but abandoned during the rapid drop to the Fort Ann level.

We took the core in the deepest part of the lake (2.8 m of water), and managed to get through 8.5 meters of sediment. We bottomed out in 1-3 cm thick silty-clay glacial-lacustrine varves. There is about 2 meters of this silty clay, with the average varve thickness decreasing up-core, before a sharp contact with a fine sand/silt unit, which we interpret as the transition from Coveville level Lake Vermont to Long Pond. About 1 cm above this contact was an amazingly convenient piece of wood, which we will send off for an AMS 14C date. This will finally give us an age for the large flood discharged through the Hudson Valley during the Coveville/Fort Ann phase transition.

The fine sand/silt unit becomes increasingly more organic-rich up core. The top several meters are nearly pure green organic muck/gyttja. There was about a 55% compression of the sediments during the coring process, but it appears to be limited to the upper water-logged organic rich sections of the core. Catherine Yansa (University of Wisconsin - Madison/Michigan State University) will do further pollen and plant macro-fossil analysis on this core.

At the NE-GSA meeting in April I presented results of our work last summer at the Salmon River site just south of Plattsburgh (see previous Glaciogram installment - Vol. 36 No. 2). The Salmon River core contained a stratigraphic record of the Fort Ann/Champlain Sea transition. The pollen analysis done by Catherine Yansa indicated a significant decline in the percentage of pine and increase in spruce pollen at this transition. This record correlates to the glacio-lacustrine abandonment of Boyd Pond on the northwest side of the Adirondacks, reported by Anderson (1988), and therefore gives us an initial age estimate of 11,200 +/- 190 14C BP (Anderson's date for Boyd Pond) for the drop from Fort Ann level Lake Vermont to the Champlain Sea that sent a large pulse of freshwater into the Gulf of St. Lawrence.

Dave Franzi, Catherine Yansa, Peter Knuepfer, and I will be leading a NYSGA-NEIGC field trip next Fall that will start at the Altona Flatrock north of Plattsburgh, NY and follow the Lake Vermont shoreline south to the outlets near Fort Ann, NY. The Platsburgh Air Force Base bluff (identical stratigraphy to the Salmon River site), and the Long Pond site will be included as stops.

Anderson, T.W., 1988, Late Quaternary pollen stratigraphy of the Ottawa Valley - Lake Ontario region and its application in dating the Champlain Sea; in Gadd, N.R., ed., The Late Quaternary Development of the Champlain Sea Basin: Geological Association of Canada, Special Paper 15, p. 207-224.

David Franzi, Center for Earth and Environmental Science, Plattsburgh State University of New York, 101 Broad Street, Plattsburgh, NY 12901; 518-564-4033 (o), 518-564-5267 (fax); david.franzi@plattsburgh.edu; http://faculty.plattsburgh.edu/david.franzi

I would like to announce that John Rayburn, Peter Knuepfer, CatherineYansa and I will be leading a field trip through the Champlain Valley for the 2002 Joint NYSGA/NEIGC Field Conference on September 28th. We shall examine new morphologic and stratigraphic evidence that provide insights into the timing of late glacial events in the region and the relationships between Lake Vermont, contemporaneous proglacial lakes and the subsequent Champlain Sea. The trip begins on Altona Flat Rock, where breakout floods from proglacial Lake Iroquois entered Lake Vermont, and ends near Fort Ann where we have discovered a possible new outlet for the Coveville Stage. The trip originates from the west parking lot of Hudson Hall on the SUNY Plattsburgh campus.

I shall refer you to John Rayburn's Glaciogram report for the details of a recent coring expedition to Long Pond near Willsboro, NY with John, Pete Knuepfer, Curt Stager, Plattsburgh alumnus Cara Gentry and a team of SUNY Binghamton graduate students. John's preliminary assessment of the core's contents is quite promising.

I have been using a one-semester sabbatical leave to become familiar with GIS technology and software and apply them to my work on the glacial geology of the northern Champlain Lowland and northeastern Adirondack Mountain region. I regret to report that after about three-months of "immersion-learning" about the only thing I've learned is how little I know about the subject. I shall press-on, however, and I hope to have some interesting new maps to show for this fall's NEIGC/NYSGA field trip.

Finally, we have been fortunate to receive NSF funding for two more years of our Research Experiences for Undergraduates Program at the Altona Flat Rock jack pine barrens. Thanks to all of my Glaciogram colleagues who referred students to us.

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Stephen Robinson, St. Lawrence University <srobinson@stlawu.edu>

Hello New York Quaternarists, and please allow me to introduce myself. I am Stephen Robinson, a new faculty member in the Geology Department at St. Lawrence University in Canton. Prior to joining St. Lawrence, I was on staff at the Geological Survey of Canada, and worked primarily on permafrost issues in northwestern Canada. My PhD is from the Department of Geography at McGill University in Montreal, where I studied carbon dynamics of discontinuously frozen peatlands for my dissertation. Although I will be continuing work in northern Canada, I also am aiming to start research with students in upstate New York, initially mapping glaciofluvial deposits with ground penetrating radar as well as hopefully starting some local peatland carbon research. Other research interests for the northern New York region include surface and groundwater monitoring and modelling, and possible climate change impacts. I look forward to talking to many of you at upcoming meetings.

Norton G. Miller, Biological Survey, New York State Museum, Albany, NY 12230-0001; E-mail: nmiller2@mail.nysed.gov

Richard Futyma (LA Group, P.C., Saratoga Springs, NY) and I have published our studies of postglacial development of the Bryon-Bergen Swamp, Genesee County, NY (Canadian Journal of Botany 79: 1425-1438. Dec. 2001). This sloping rich fen is a mosaic of marl and peat deposits, the accumulation of which was found to vary spatially and temporally during the Holocene. We used pollen and sediment stratigraphic data to decipher aspects of vegetation stability and change, by selecting a study site in the south-central part of the 800-hectare mire complex for detailed paleoecological study.

Rich and I also collaborated on the preparation of a paper for Smith Symposium II (The Hiscock Site: Late Pleistocene and Holocene Paleoecology and Archaeology of Western New York State), the Proceedings of which will be published by the Buffalo Society of Natural Sciences later this year. In our paper, we present and interpret a high resolution and abundantly radiocarbon dated pollen diagram for Divers Lake in southwestern Genesee County and integrate the pollen record from this site with other paleobotanical records near the stratigraphically incomplete Hiscock basin, including our work at Byron-Bergen Swamp and a kettle hole wetland near the Lamb archaeological site. The Divers Lake record includes the first recognized occurrence in western New York of tundra vegetation on the basis of plant macrofossils such as *Dryas integrifolia* and associated seeds and fruits of other open ground plants.

I have been collaborating with Helen Delano (Pennsylvania Geological Survey, Middletown) and Noel Potter, Jr. (Dickinson College, Carlisle, PA) on investigations of sediments in a small sag pond in colluvium over dolomite. Kings Gap Pond is located in south-central Pennsylvania at the base of the northwest side of South Mountain at an altitude of 650 ft, 100 mi south of the Wisconsinan terminal moraine. Surprisingly, the Kings Gap Pond sediments contain a long record of tundra vegetation, on the basis of an excellent and stratigraphically robust assemblage of vascular plant and moss macrofossils. Organics at the base of the sampled section at 4.86 m have been dated at 16,080 ± 60 C-14 yr B.P., and a twig 2 m below the sediment surface was 14,540 ± 50 yr B.P. Fossils of tundra plants yield to spruce needles and spruce needle parts above 14.45 C-14 ka. A pollen diagram to accompany the plant macrofossil stratigraphy is in preparation, as are other coordinated analyses of the sediment. Our work to date on this site was presented recently in a poster at a recent meeting of the Northeastern Section Geological Society of America (see Abstracts Programs NE Sec. GSA A-27. 2002).

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Robert Titus, Hartwick College, Oneonta, NY 13820 <titusr@hartwick.edu>

Robert Titus continues to work on the glacial geology along the Catskill Front for publications in Kaatskill Life magazine. Recently he did one on the alluvial fan in Palenville. In the near future he plans articles on the glacial spillways at North Lake State Park. He will also likely do an article on the cirques at Echo and North Lakes. Titus' book "The Catskills in the Ice Age" has sold out and will soon go to a second edition.

Michael Kudish, Professor, Division of Forestry, Paul Smith's College, Rts. 86 & 30, Paul Smiths, NY 12970; 518-327-6369; 518-327-6369 (fax); kudishm@paulsmiths.edu

13,000 Years of Catskill Forests

A reconstructrion of the history of Catskills forests began with a 1971 dissertation, Vegetational History of the catskill High Peaks. This reconstruction was limited only to the last 300 or 400 years from written records and ring counts from stumps and broken tree trunks. Studies continued in this limited fashion until 1994 when I discovered that peat in Catskills bogs contained preserved macrofossils (leaves, needles, wood, bark, twigs, fruits, seeds, cones, roots) which could be identified. In 1995, the first peat samples were shipped to Beta Analytic, Inc. of Miami, Florida for carbon-14 dating. Some 60 dates from 40 different bogs have been received so far in this long-term, ongoing study. Coupled with identified macrofossils, the ^{14}C dates have pushed forest history reconstruction back to about 13,000 years.

Most of the bogs occur at higher elevations; between 700 and 1100 meters, on very shallow till - generally 0.4 to 0.7 m overlying sandstone, shale, and conglomerate bedrock. Upland bogs are small, typically 50 to 100 m across, and the peat which has accumulated in these shallow basins also is only 0.3 to 0.7 m thick. Samples of peat from the bog bottoms date from as little as 300 years to about 10,000 years - a phenomenally large range in age. The median age is about 3500 years.

From several of these bogs, I had from two to four peat samples each, from varying depths, radiocarbon dated to see changes in forest over time. In several other bogs, I had radiocarbon dated two peat samples each from the same depth, but horizontally about 10 to 30 m apart. Surprisingly, the ^{14}C ages would be quite disparate, often by 1000 to 3000 years.

The oldest peat occurs at the bottoms of mainly larger bogs at lower elevations, 200 to 600 m, around the Catskills southern periphery. Some of these bogs rest directly on till and others on glaciolacustrine silts. The five oldest dates, uncorrected ^{14}C values, are 8990, 9440, 9610, 11840, and 11880 years. When these are corrected to compensate for inaccuracies of ^{14}C dating, the ages become respectively 10239, 10731, 10981, 13881, and 13890 years.

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Many years ago at a Friends meeting led by Art Bloom in the Ithaca area, I told Ernie Muller that I was going to go back to Vermont and look for "my" fossil forest. It didn't happen, but I kept on looking for dateable organic material. In the fall of my 43rd year at Norwich University I led an NEIGC field trip in the Montpelier quadrangle. At what I had interpreted as a bona fide two-till site, i.e. two separate glaciations, Jack Ridge pulled organics out of a clas (0.5 x 2.0m) in the upper till. When Geochron asked me what I thought the date would be, I assuredly said at least 25,000 BP. I couldn't believe it when the AMS date came back 11,900+/-50 ^{14}C years BP, which is the same age assigned by Jack to the readvance at Littleton-Comerford dam. So, for my first c-14 date I fooled myself and we ended up with "the Middlesex readvance".

This is what I sent to Geochron for my first C-14 date:

Sample Name:	Culver Brook #1 (10/3/99)
Provenence :	The sample of wood was collected from a clast (transported slab) of fine-grained, ponded (lacustrine?) sediment that was incorporated in the upper of two tills exposed in an eroded bank on the south side of Culver Brook. the exposed portion of the clast/slab measured 2.0 m by 0.5 m.
Site Location:	The site is on the Montpelier, Vermont, 7.5-minute quadrange 0.55 km (0.34 mi) No50°W of the west end of Wrightsville Dam, which is 5.4 km (3.37 mi) due north of the Vermont State Capitol in Montpelier, Vermont
Sample material:	wood
Contaminants:	Contamination of the sample is unlikely because of the rural, forested area where it was collected and because it was buried and only recently exposed by erosion
Estimated age:	Probably between 25 ka and 30 ka during advance of the Late Wisconsin ice sheet in central Vermont

This is what I sent to Geochron for my second C-14 date (this was in October of 2000, the year I retired):

Sample Name:	Fecteau Homes #1 (collected 10/25/98; submitted 10/20/2000)
Provenence:	The sample of wood was collected from a low angle unconformity or thrust fault in a thick section of varved clay and silt that was deposited in glacial Lake Winooski
Site Location:	The site is on the Barre West, Vermont, 7.5-minute quadrangle 1.07 km (0.65 mi) S20.5°W of the confluence of the Winoosdki River and the Jail Branch
Sample material:	wood
Contaminants:	Sample was not properly cared for and has been unwrapped since it was collected.
Estimated age:	The sample age could be less than 100 yrs as a result of slumping, or could be 11,000-12,000 B.P. and related to a possible readvance of the ice sheet

The date reported by Geochron is 4090+/-60 ^{14}C years BP, which basically tells us that slumping occurred in lake Winooski varves during the mid-Holocene. I know it was a stretch because of the setting, but I was hoping for confirmation fo the Middlesex readvance.

And in my second year of retirement yet another organic site and one that is really exciting. On November 21, 2001,Rick Dunn, my replacement at Norwich, and I collected peat-like organic material from interbedded fine to very fine sand and peat in the Randolph, Vermont, quadrangle.

This is what I sent to Geochron for my third C-14 date:

Sample Name:	Hogdon Farm #1 (11/21/01)
Provenence:	The sample was collected on a cut-off slope of Ayers Brook 13.5 ft. below the surface of a stream terrace that is underlain by 7 to 9 ft. of fluvial deposits. The sample is from an organic layer 0.5 to 1.0 thick within a sequence of ponded sediments of interbedded yellowish-brown very fine sand, orangish-brown fine sand, light gray very fine sand and silt.
Site Location:	The site is on the Randolph, Vermont, 7.5-minute quadrangle 2.05 km (1.25 mi) N18.5°E of the junction of Vermont Routes 12 and 12A in the village of Randolph, Vermont
Sample material:	peaty layer with wood (more material is easily obtained)
Contaminants:	Sample may contain roots of surface plants.
Estimated age:	Probably several hundred years. the situation is complex. The ponded sediments from which the sample was collected occupies a space once occupied by lake-bottom deposits of glacial Lake Hitchcock. It appears that Lake Hitchcock sediments had to be removed by erosion and the site reoccupied by a pond that received fine-grained sediments and organics. It points to downvalley damming of Ayers Brook after it had cut down at the sample site.

Wrong again! The date reported by Geochron is 8700+/-150 ^{14}C years BP or early Holocene. Also, I had to revise my initial idea about the ponded sediments occupying space once occupied by sediments of Lake Hitchcock. I initially thought that I was dealing with a deep beaver pond. It now appears that following the draining of Lake Hitchcock the main (Third Branch of the White River) valley was filled with lake-bottom sediments while a tributary (Ayers Brook) valley was not. Therefore, the tributary valley collected organic sediments until shortly after 8700 BP.

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All samples are AMS dated.

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U.S. GEOLOGICAL SURVEY
EASTERN EARTH SURFACE PROCESSES TEAM
14 C LABORATORY

14 C Results for: Onondaga Lake sites

WW	SAMPLE ID	REGION	14 C AGE	+/-	DATED ON	d 13C	MATERIAL
3802	Piezometer- 1 (~65+')	Onondaga Lake - METRO	10,500	96	2/15/ 02	-25	wood
3803	Piezometer- 2A (~65+')	Onondaga Lake - METRO	10,385	67	2/15/ 02	-25	wood
3804	Piezometer- 2B (~65+')	Onondaga Lake - METRO	10,356	79	2/ 15/ 02	-25	wood (pine cone)
3809	Kirk- 1 (58-60)'	Onondaga Lake - Kirkpat.St.	7,977	55	2/ 15/ 02	-25	wood
3810	Kirk- 2 (30')	Onondaga Lake - Kirkpat.St.	4,958	47	2/ 15/ 02	-25	wood

NOTES: ?

Samples were processed at the 14C Laboratory of the U.S. Geological Survey in Reston, Virginia.

? 14C ages were determined at the NSF-University of Arizona Accelerator Mass Spectrometry Laboratory, Tucson, AZ.

? The quoted age is in radiocarbon years (BP) using the Libby half life of 5568 years.

? WW is the identification assigned to a sample by the USGS 14C Laboratory.

?Values reported for d 13C are the assumed values according to Stuiver and Polach (Radiocarbon, v.19, p. 355, 1977) when given without decimal places. Values measured for the material itself are given with a single decimal place.

Comments or questions on 14C analyses may be referred to:
Jack McGeehin, U.S. Geological Survey, M.S. 955 National Center, Reston, VA 20192
voice: (703) 648-5349, fax: (703) 648-6032, <mcgeehin@usgs.gov>

Sample 3802 - recovered by onsite personnel on 19 July, 2001 from Piezometer 1 at Metro plant. Depth of sample was noted at 100-120 feet below land surface (recovered from drilling muds) Nearby drilling log B-2001/1 by Parratt-Wolff (9/15/2000) indicates organic zone from 55 to 75 feet below surface as grey f. sand, little silt with tr. of wood and pine cones. Zone 75-135 ft described as grey silt, tr. f. sand grading to brown/grey clay, tr. silt and sand -- no organics -- sample probably came from upper zone between 55-75 feet. Samples 3803 and 3804 - recovered by onsite personnel on 7 August, 2001from Piezometer 2 at the Metro plant. Depth of samples was noted as 100 feet or more below land surface (recovered from drilling muds) See drilling log B-2001/1 notes above (sample 3802). Sample probably came from 55-75 ft depth.

Sample 3809 - recovered by USGS on 25 September, 2001 from observation well #1 at Kirkpatrick St. pumpstation. Wood sample is from 58'-60' split spoon taken in grey c. to m. sand, tr. silt.

Sample 3810 - recovered by USGS on 2 October, 2001 off 3-foot bucket auger installing a pumping well bore for an aquifer test at the Kirkpatrick St. pumpstation. Wooden branch/log (4-in diameter by 1.5 ft long) was recovered from a depth of ~ 30-32 feet. Nearby well log indicates materials are grey/green c. to f. gravel and silt grading to grey f. to c. sand and m. gravel with little silt at these depths. Wood material identified as eastern hemlock (Tom Yanosky - USGS Reston, Vegetation and Hydrogeomorphology Unit, NE Regional Research)

WW	SAMPLE ID	REGION	14 C AGE	+/-	DATED ON	d 13C	MATERIAL
2136	Webster Rd. 10-8	Webster Rd., Town of Lafayette	6,160	40	01/23/99	-25	wood
2137	Webster Rd. 10-9	Webster Rd., Town of Lafayette	6,110	50	01/23/99	-25	peat/grass
1863	Onondaga #1	Webster Rd., Town of Lafayette	9,870	40	07/28/98	-25	wood

NOTES: ?

Samples were processed at the 14C Laboratory of the U.S. Geological Survey in Reston, Virginia.

? 14C ages were determined at the Center for Accelerator Mass Spectrometry (CAMS), Lawrence Livermore National Laboratory, Livermore, California

? The quoted age is in radiocarbon years (BP) using the Libby half life of 5568 years.

? WW is the identification assigned to a sample by the USGS 14C Laboratory.

?Values reported for d 13C are the assumed values according to Stuiver and Polach (Radiocarbon, v.19, p. 355, 1977) when given without decimal places. Values measured for the material itself are given with a single decimal place.

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Sample 2136 - recovered at interface between original land surface and mudflow materials along Onondaga Creek. The site is located just north of 1993 Lafayette (Tully Valley) landslide on left bank of creek, about 300 ft. upstream of Webster Road bridge over Onondaga Creek. (See USGS Fact Sheet 190-99, June 2000 "History of landslides at the base of Bare Mountain, Tully Valley, Onondaga County, New York.")

Sample 2137 - recovered at interface between original land surface and mudflow materials along Onondaga Creek. The site is located just north of 1993 Lafayette (Tully Valley) landslide on left bank of creek, about 300 ft. upstream of Webster Road bridge over Onondaga Creek. (See USGS Fact Sheet 190-99, June 2000 "History of landslides at the base of Bare Mountain, Tully Valley, Onondaga County, New York.")

Sample 1863 - Recovered from streambed/streambank of Onondaga Creek, several feet below samples 2136 and 2137. Wood taken from one of 3 logs oriented toward the northeast in a layer of gravel. The site is located just north of 1993 Lafayette (Tully Valley) landslide on left bank of creek, about 300 ft. upstream of Webster Road bridge over Onondaga Creek. (See USGS Fact Sheet 190-99, June 2000 "History of landslides at the base of Bare Mountain, Tully Valley, Onondaga County, New York.")

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Coring in Ohio Corn Fields for Fun and Profit – OK for Fun

Greg Wiles, College of Wooster, Don Pair, University of Dayton, and Tom Lowell, University of Cincinnati.

Last spring Greg secured an education grant from the Keck Consortium to expose undergraduates to field based Quaternary investigations. As those of you who know him realize, it was again up to Don and Tom to bail him out. To accomplish this objective eight students from a host of undergraduate colleges undertook extensive coring of bog depressions on top of the glacial drift in southern Ohio.

The science objective was two fold: refine the chronology of deglaciation and acquire records of environmental change. Toward that end, we sampled 10 sites along the interlobe area between the Miami and Scioto Lobes and extending northward interior to the Union City/ Powell moraine line. Preliminary results of the paleoenviromential findings are being made in mid-April where students will report the analysis they did on their specific site. Thus, eight sites will receive attention.

As of interest we report here the 8 resulting basal dates – they range from 16,170+/197 up until 14,390+/-120 14C yr B.P. – all in all a pretty old collection. Of special interests are the collection of ~16,000 yr ages all found near Mechanicsburg. At this location, some 75 km from glacial maximum, these ages suggest that the ice sheet was splitting up along topography of the interlobate moraine.

We are now in the planning stages of a second effort this summer so will report when we have a better handle on deglaciation.

SITE	NORTHING	EASTING	Conventional age	Lab Number	Material	Type	Comment
0102	4462554	261325	35,120+/-820	AA45068	silt	basal trash layer	thought to be reworked
0103	4439537	272534	15,810+/-140	AA4506	silt	plant material	
0104	4434591	281530	15,350+/-100	AA45072	silt	plant material	
0105	4436243	273712	15,563+/-91	AA45073	silt	wood scraps	
0106	4438232	271841	14,986+/-98	AA45074	silt	basal trash layer	age inversion in this core
0107	4479620	254371	14,360+/-120	AA45077	silt	low organic concentration	
0109	4498196	261590	14,600+/-91	AA45078	silt	basal trash layer	
0110	4436675	277984	16,170+/-97	AA45079	silt	organic material	

UTM Zone east of 84°

All dates by Arizona AMS lab

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I am kept quite busy with my current projects. I am working with Jim Albanese and Jay Fleisher (Oneonta) on a paper that follows a poster given at NEGSA, Springfield, March, 2002. It will summarize some of our work at Bering Glacier dealing with landscape modification due to subglacial erosion associated with the 1993-95 surge, and subsequently exposed during retreat (Landform Development and Systematic Glacial Retreat, Bering Glacier, Alaska). Much of our findings relate the pre-surge landforms of Weeping Peat Island with the post-surge landforms currently being documented by GPS mapping.

Gordon Connally and I are examining lake clays (varves) in the Schoharie and Hudson-Champlain Valleys, and cooperating with Jack Ridge (Tufts) to attempt a regional correlation. Preliminary cores were obtained with a Geoprobe near Crown Point and Bridport. This data will be discussed during a NYSGA fieldtrip this fall, September 27-29,2002, where we are leading a trip "Glacial Lake Albany in the southern Champlain Valley". We will examine the expansion of Glacial Lake Albany from the Hudson to the Champlain Valley, in contact with the receding ice margin. Expansion began with recession from the Luzerne Readvance, -13.15ka, and continued through the Bridport Readvance, -11.90ka. We will emphasize critical relationships at the Streetroad and Crown Points deltas, and at the East Middlebury delta; will visit the Fair Haven and Glens Falls deltas and two sites near Crown Point that provided recent cores for varve analysis; and revisit the type localities for the Luzerne and Bridport Readvances.

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Three aspects of my research are continuing on vegetational and climate history. The first two involve deglaciation, and the third focuses on recent climte history:

1) With technician Dot Kurdyla, we are examining a number of late-glacial records in the Bering Glacier region. This work is in collaboration with Ernie Muller, Jay Fleisher, and Matt Lachneit. LOI, pollen, and macrofossil analysis with AMS C-14 dating of the macrofossils is in progress on both sides of the Bering Glacier.

2) With graduate student Dee Pederson, technician Dot Kurdyla, and colleague Terryanne Maenza-Gmelch, we are examining deglaciation and carbon storage in various New York wetlands. A new core from Sutherland Fen shows a high rate of sedimentation during the late-glacial, followed by lower accumulation rates during the Holocene.

3) A new initiative attempts to understand the last millennium of climate change in the Hudson Estuary marshes. Dee Pederson, Dot Kurdyla, and Agnes Sugar are working with us. High sedimentation rates in the marshes provide a high-resolution study of human impact and natural climate variability.

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Research this past year has again focussed on glacier histories and climate change in southern Alaska. I have now completed the Nellie Juan long tree-ring chronology; it spans AD 1150 to 1999 and primarily reflects summer temperatures and insolation. A paper detailing this new chronology and the late Holocene history of Nellie Juan Glacier has been submitted to Annals of Glaciology. I will be presenting this paper at the International Glaciological Society meeting on Fast Glacier Flow in Yakutat, Alaska, this June. While at this IGS meeting I will also be helping lead a fieldtrip to look at the glacial geology of the Yakutat Foreland. Writing the field guide should keep me busy through to the end of classes!

Last October I did find time for a quick glacial geologic excursion into White Brook Valley in the Adirondack High Peaks. I am continuing to look for evidence relating to an interval of local glaciation following retreat of Laurentide ice during the late Wisconsin. For this trip I focussed on the north side of the valley looking for the end moraines reported by Craft (1976). Much of the area is heavily gullied and the challenge is distinguishing erosional topography of the gullies and their interfluves from constructional relief associated with moraines. One large bouldery ridge was located in an area away from significant gullying; however, tracing the ridge confirmed that it was a mass wasting deposit that originated from an area of broken cliffs along the north side of White Brook Valley.

On the New York tree ring side of things, Gene Domack kindly took me to his field sites near Oneida Lake last August. The eroding point bars along Fish Creek contain lots of submerged subfossil wood that may prove useful for building long tree ring chronologies for this region. However, the challenge will be obtaining the samples from underwater.

Finally, this May I will be teaching one week of the SUNY Cortland field geology course at our field station in South Bethlehem, just south of Albany. For the past 2 years I have had students surveying and characterizing a migrating reach of Onesquathaw Creek where a house and a road bridge are being threatened. It appears that the unstable character of this creek is a direct result of Holocene redistribution of gravel from an upstream Pleistocene delta that built out into Glacial Lake Albany. We will be continuing this work this summer and there are still places available if anyone has students still looking for field camp or summer credits in geology. Contact me as soon as possible for details.