



Hudson – Mohawk Professional Geologists Association

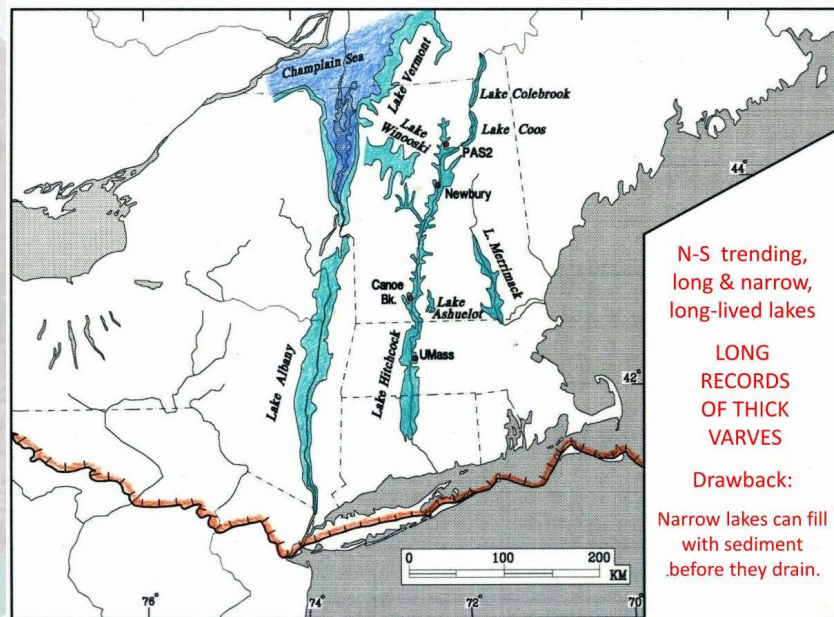
M A R C H
M E E T I N G

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March 15, 2023



The Deglaciation of New England and its Relation to Climate and Correlation to Glacial Events in New York



N-S trending,
long & narrow,
long-lived lakes

LONG
RECORDS
OF THICK
VARVES

Drawback:
Narrow lakes can fill
with sediment
before they drain.

Speaker: Jack Ridge, PhD
Dept. of Earth and Climate Sciences, Tufts University

This course is approved for 1 PDH

Abstract: The formulation of a complete and accurate chronology of the last deglaciation in the northeastern U.S. is hampered in many places by a lack of radiocarbon ages that can be tied to deglacial ice front positions and events such as readvances, and the formation and drainage of glacial lakes. In most places it prevents us from clearly determining rates of ice recession and the relationship between deglacial events and climate oscillations depicted in North Atlantic climate records, specifically ice core records from north-central Greenland. In New England a continuous and well calibrated record of deglaciation can be derived from a revamped long varve chronology (5659 years) and the radiocarbon dating of plant fossils in the varves. The varve records have the added advantage

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Abstract: (cont'd) of representing a record of glacial melting rates for the receding glacier that can be matched to and resemble, down to a sub-century scale, the oxygen isotope temperature record in Greenland. The periods of thinner (low melting) and thicker (high melting) varves in New England all correspond to cooling and warming events in Greenland and indicate that New England deglaciation rates and events are in lock step with North Atlantic climate. Glacial readvances do not appear to be glaciological adjustments such as glacial surges that are not-directly related to climate oscillations. In New York there is no continuous varve record but only a relative age record of the formation and drainage of glacial lakes in which only relatively short varve records have been assembled. Paleomagnetic records of remanent declination can be matched from both New York lakes and varves in New England leading to a correlation between the areas to within ~300 years. This correlation and the calibration of varves in New England allows us to compare and correlate glacial events that match across the region well within the uncertainty of paleomagnetic correlations and radiocarbon ages. Across the Northeast, glacial readvances match and depict periods of ice recession with accelerating rates of deglaciation through time that are punctuated by readvances and end moraine-building events. In order to create such a record, it has been necessary to fuse varve, radiocarbon, morpho-stratigraphic, and paleomagnetic records to create a continuous and expanded chronology of deglaciation.

About the Presenter: Jack's research interests lie in the reconstruction of the last deglaciation in the northeastern U.S., primarily as indicated by the annual layering (varves) of sediments from glacial lakes. This work has involved correcting the New England Varve Chronology, calibrating it with radiocarbon ages, and expanding its paleomagnetic declination record in order to correlate varve stratigraphy across a wider geographic area. The main goal of this research is to assemble high-precision (annual) records of terrestrial glacial events in the northeastern U.S. that can be compared to regional and global records of climate. This comparison can be used to test a number of hypotheses regarding the mechanisms for rapid climate change events at the end of the last glaciation and the interactions of terrestrial ice sheets, the ocean, and the atmosphere in the North Atlantic region as they relate to ice age climate.

An additional, more local, research interest of his is the geology of the Middlesex Fells Reservation, the largest forest preserve in an urban area in the U.S. Since 2008, Jack has satisfied his addiction to field geology by working in the Middlesex Fells. He describes it as very educational and rewarding to involve himself in local glacial geology as well as bedrock geology. Learn more about his Fells research and outreach project, The Geology of the Middlesex Fells.

Reservations are required by Monday March 13, 2023

Whether attending the dinner or only the in-person presentation

Register on-line at www.hmpga.net

Questions? Call or email Jonathan Dippert at (518) 786-7563 • j.dippert@ctmale.com



Cost: \$10.00 for student members*

\$25.00 for dormant geologists

\$30.00 for members

\$35.00 for non-members

In-person program only: Free

**+PDH certificate available for: \$5.00 (member w/ dinner) •
\$10.00 (member for program only) • \$20 (non-member)**

* Student dinner sponsorship available for qualifying students - contact Jonathan Dippert • j.dippert@ctmale.com

Location: Century House
997 New Loudon Road
Latham, NY 12110

Time: Social Hour 5:00pm
Dinner 6:00pm
Program 7:00pm

Sponsorship is available for this meeting! Dinner sponsors receive free dinner, a display table set up for the social hour and a 5-minute presentation to the dinner audience, prior to the presentation. Please contact Jonathan Dippert at j.dippert@ctmale.com for more information.