

Northeastern Section - 48th Annual Meeting (18–20 March 2013)

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ICE MARGIN RETREAT RATE ESTIMATES FROM VARVE SEQUENCE CROSS-CORRELATION IN GLACIAL LAKE VERMONT SEDIMENTS, LAKE CHAMPLAIN VALLEY, NEW YORK

Paper No. 50-4

Presentation Time: 3:10 PM

ICE MARGIN RETREAT RATE ESTIMATES FROM VARVE SEQUENCE CROSS-CORRELATION IN GLACIAL LAKE VERMONT SEDIMENTS, LAKE CHAMPLAIN VALLEY, NEW YORK

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Good regional correlation has been demonstrated between varve sections in glacial Lake Hitchcock (Connecticut River Valley) and glacial Lake Albany (Hudson River Valley) which are both part of the North American Varve Chronology (NAVC). But this correlation has never been successfully extended into glacial Lake Vermont (Lake Champlain Valley and southern Quebec). Even varve sections within the Champlain Valley have not demonstrated inter-basinal cross-correlation. The reason for the lack of regional correlation is that all Champlain Valley sections investigated to date are younger than the regionally correlative sections of the NAVC. The lack of inter-basinal correlation may be attributed to strong local influences on sedimentation which may drown out the more regional signal in the varves. Our recent innovation in quantitative varve sequence analysis and cross-correlation has finally allowed us to positively match two varve sections within the Champlain Valley. We are able to filter out the local effects by detrending the sequences using a low-pass Fourier filter, normalizing the resulting curves to rescale the sequences to a common range, and running a cross-correlation.

The two sections, one at Whallonsburgh, NY containing 185 varves (measured by us), and one about 25 km north at Keeseville, NY containing 67 varves (measured by Jack Ridge) were both deposited during the Coveville (initial high-water) phase of Lake Vermont. The cross-correlation demonstrates that the upper 73 Coveville varves are missing in the erosional unconformity at the top of the Keeseville section. This allows us to estimate ice retreat rates within the Champlain Valley. South of Keeseville, where the valley is narrower, the ice margin appears to retreat at the relatively rapid rate of about 0.5 km/year. North of Keeseville we estimate a rate of about 0.25 km/year, which is also what is estimated in southern Quebec by Richard and Ocheitti (2005). We are still unable to cross-correlate Lake Vermont varves with the NAVC.

Session No. 50

[T10. Glacial History of the New England–Canadian Border Region](#)

Tuesday, 19 March 2013: 1:30 PM-5:15 PM

[Omni Mount Washington Resort Monroe Room](#)

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See more of: [Glacial History of the New England–Canadian Border Region](#)

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