ABSTRACT FORM FOR 1997 GSA ANNUAL MEETING

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№ 03100

EPISODIC INPUTS OF TERRESTRIAL SEDIMENT TO A POST-GLACIAL MOUNTAIN LAKE

BROWN, Sarah L., sbrown1@zoo.uvm.edu, BIERMAN, Paul, R., MEHRTENS, Charlotte J., and LINI, Andrea, Dept. of Geology, Perkins Hall, University of Vermont, Burlington, VT 05405

Ritterbush Pond, north central Vermont, preserves a record of episodic sedimentation events since deglaciation (>12,000 14-C ybp). An initial, well-dated core revealed a series of inorganic horizons in organic gytja (Lin et al, 1995, GSA Abs.), a pattern not usually seen in other New England lake cores. Sedimentologic and stable carbon isotope data suggest that these inorganic horizons have a terrestrial source; 14-C dates bracketing the horizons indicate that deposition was rapid. Using a modified Reasoner coring device, we retrieved three additional continuous cores, one from the lake center (C2) and two from the lake margin (C3, C4), in order to characterize the nature and distribution of the terrigenous sediment.

In each core, magnetic susceptibility, X-radiographs, and cm-by-cm loss-on-ignition (LOI) correspond with stratigraphic data and delineate the boundaries of 20 to 40 discrete inorganic horizons per core, of which there are two types: thicker (1-10 cm) graded beds and thinner (0.2-1 cm) laminations. Inorganic sediments have 5 to 15% LOI and the surrounding gytja averages 35% LOI. Core C2 (5.61 m, water depth = 13.5 m) is characterized by black gytja in sharp contact with graded horizons (2-10 cm) of silt and fine sand and thin (<5 mm) silt laminations. Core C3 (5.06 m, water depth = 7.8 m) is comprised of macrofossil-rich, silty brown gytja and graded horizons (2-7 cm) of silt and fine sand bounded by leaf and macrofossil layers. The laminations in C3 are thicker (<1 cm) and coarser (very fine sand) than those in C2. Core C4 (4.75 m, water depth = 12.0 m) is characterized by brown gytja with less organic material than C3. In C4 the graded horizons (2-7 cm) are of silt and fine sand and the thin (<1 cm) laminations of silt.

The graded nature and distinct upper and lower boundaries of the inorganic horizons suggest they were deposited by turbidites. In all three cores, these turbidites are common in the upper and lower sections and absent in the middle of the cores. This uneven distribution throughout the cores suggests a fluctuating rate of hillslope erosion in the 2.2 km^2 steeply sloping watershed. Such variation implies that changes in vegetative cover, soil moisture or storm frequency influenced hillslope stability during the Holocene.

We thank P.T. Davis of Bentley College for his assistance with coring and lab equipment and techniques.

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Holocene, lake, core, turbidite, climate change

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Name SARAH L. BROWN
Department GEOLOGY
Institution UNIVERSITY OF VERMONT
Address PERKINS HALL
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