EPISODIC FAN AGGRADATION IN THE WINOOSKI RIVER DRAINAGE BASIN, NORTHWESTERN VERMONT

CHURCH, Amy B., and BIERMAN, Paul R., Dept. of Geology, University of Vermont, Burlington, VT 05405

Debris and alluvial fan deposits in northwestern Vermont occur most frequently at the break in slope between steep highlands and adjacent river terraces. The fans are fed by ephemeral drainages and have the characteristic shape of a portion of a right circular cone. Excavation of a fan in the Huntington River sub-basin demonstrates that the fan deposit can be studied in a radiocarbon-controlled chronological framework. Fan aggradation rates calculated using fan geometry and radiocarbon ages of wood and charcoal (Fig. 1) can be used to understand the timing of hillslope erosional events. We constructed a history of fan aggradation for the last 8,000 ^{14}C years (Fig. 2).

The Huntington fan (≈ 4,000 m^3) is fed by an approximately 70,000 m^2 drainage basin. The fan is underlain by paleo-Huntington River gravels, which are underlain by glacial Lake Vermont deposits. Trenching of the fan revealed sedimentological structures and textures which imply stream- and debris-flow deposits, as well as paleosols which cross-cut depositional units. Three trenches within the fan contain abundant organic material suitable for radiocarbon dating.

The four radiocarbon ages and the volume of deposited sediment indicate that fan aggradation has been episodic throughout the last 8,000 ^{14}C years. Rates of fan aggradation were high during the first 500 years of the fan's existance, lower during most of the Holocene, and highest during the last 300 years-the period of settlement and deforestation (Fig. 2).