

Paper No. 37-3

Presentation Time: 9:00 AM-9:20 AM

EROSION OF THE SUSQUEHANNA RIVER BASIN: ASSESSING RELATIONS BETWEEN ^{10}Be - DERIVED EROSION RATES AND BASIN CHARACTERISTICS

[REUTER, Joanna M.](#)¹, BIERMAN, Paul R.², PAVICH, Milan³, GELLIS, Allen C.⁴, LARSEN, Jennifer¹, and FINKEL, Robert C.⁵, (1) Geology, Univ of Vermont, Perkins Hall, Burlington, VT 05405, jreuter@uvm.edu, (2) Geology Department and School of Natural Resources, Univ of Vermont, 43 Colchester Avenue, Burlington, VT 05405-0122, (3) U.S. Geol Survey, 12201 Sunrise Valley Drive, Reston, VA 20192, (4) Water Resources Division, U. S. Geol Survey, Mail Stop 966, 8987 Yellow Brick Road, Baltimore, MD 21237, (5) CAMS, Lawrence Livermore National Lab, MS L-206, 7000 East Avenue, Livermore, CA 94550-9234

We are using cosmogenic ^{10}Be measured in river sediment to estimate basin-averaged, long term (10^4 - 10^5 year) sediment generation rates for 0.6 to 62,000 sq. km sub-basins of the Susquehanna River system. For 12 basins south of the Wisconsin glacial margin, the sediment generation (erosion) rates range from 8-19 m/My, with a mean of 13 m/My. The ^{10}Be based rates are positively correlated ($R^2=0.5$) with sediment yields obtained from USGS gaging stations at the sample sites, implying broadly consistent rates of sediment yield on decadal time scales and erosion on millennial timescales. However, this correlation does not include three Piedmont basins with sediment yields that imply erosion rates in excess of 30 m/My. These three basins are heavily farmed, including widespread use of traditional agricultural practices.

Results are forthcoming for an additional 72 sediment samples, dominantly from basins <10 sq. km in area. Most of these basins are south of the Wisconsin glacial margin, have mean slopes that span a range of 20°, represent three lithologies (sandstone, shale, and schist), and are distributed among the Appalachian Plateaus, Piedmont, and Valley and Ridge physiographic provinces. The results from these basins will be used to investigate relationships between sediment generation rates and GIS-measurable characteristics of the present-day landscape.

[Northeastern Section \(39th Annual\) and Southeastern Section \(53rd Annual\) Joint Meeting \(March 25–27, 2004\)](#)
[General Information for this Meeting](#)

Session No. 37

[Geomorphic Process Rates on the Passive Margin](#)

Hilton McLean Tysons Corner: Sully A

8:00 AM-12:00 PM, Friday, March 26, 2004