

## IDENTIFYING THE SOURCE OF EXCESS FINE-GRAINED SEDIMENTS IN NEW JERSEY RIVERS USING RADIONUCLIDES

Joshua C. Galster, Huan Feng, Kirk Barrett, Nicole Bujalski, and Jared Lopes  
Department of Earth and Environmental Studies and Passaic River Institute, Montclair State University, 1 Normal Ave, Montclair, NJ 07043, (p) 973-655-4123, galsterj@mail.montclair.edu

Fine-grained sediment is currently a major pollutant in New Jersey rivers as well as other states. Excess sediment affects biologic systems, river aesthetics, recreation and water supply. However, one barrier to controlling sediment supply is that it is often difficult to determine the source of this sediment. The sediment may originate from widespread but shallow surficial erosion from overland flow occurring in the watershed or from the lateral erosion of vertical channel bank material. The goal of this study was to distinguish between these two sources using their different radionuclide signatures, including  $^7\text{Be}$ ,  $^{210}\text{Pb}$ , and  $^{137}\text{Cs}$ . Sediment generated from surficial erosion should have higher activity levels of these atmospherically-deposited radionuclides with short half lives than the sediment produced from vertical channel banks. We sampled channel bank material, watershed soils, in-stream fine sediment, and suspended sediment and analyzed them for their radionuclide signature to identify the relative contributions of sediments from the watershed and channel banks. The sampling was done for two small watersheds in New Jersey, each of which has sediment predominantly supplied by either overland flow or channel bank erosion. This knowledge will allow for improved stream and watershed management and the possible initiation of sediment-reduction programs.