

Predicting the Movement of Fine-grained Sediment (and associated contaminants) Through Watersheds: A Geological Modeling Approach

Predicting the movement of fine-grained suspended sediment and associated contaminants through river corridors is key for many watershed restoration plans. Available models typically treat fine-grained sediment as washload that travels along with the water in rivers, predicting very rapid downstream transport, but geologists have long recognized that even the smallest particles may be stored for long periods in alluvial deposits, potentially interrupting downstream transport for years to millennia and effectively controlling the timing of downstream delivery. In my talk, I will describe a method for including the time sediments are stored in alluvial deposits in watershed scale sediment transport models, and illustrate how these models can be parameterized using radiometric dating and other geological methods for analyzing sediment stored in river corridors. Applications focus on current efforts to restore the Chesapeake Bay and predicting the movement of arsenic-contaminated mine tailings in meandering rivers.