

Soil and Water Science Department Seminar

Speaker: **Minjune Yang**
Ph.D. Dissertation Degree Candidate

Advisor: Dr. James Jawitz and Dr. Michael Annable

Title: **Forward and Back Diffusion through
Low-permeability Aquitards**

Date: Monday, October 12th

Time: 3:00 pm

Location: McCarty Hall B, Room G086



Solute transport processes, including advection, dispersion, diffusion, sorption, and degradation, directly influence the quality of groundwater resources. Because aquifers are water supply sources, solute transport in these systems has received much attention over the past several decades. More recently, increased attention has been focused on low-permeability aquitards such as clay and silt layers, where solute transport is dominated by molecular diffusion rather than advection. Molecular diffusion is the process by which solutes move from a region of greater concentration toward another with lower concentration. The term ‘forward diffusion’ can be defined as the process by which solutes (such as groundwater contaminants) diffuse from aquifers with relatively higher concentration into aquitards with lower or zero solute concentration. Current interest in aquitards is focused on back diffusion. The term ‘back diffusion’ can be defined as the process subsequent to forward diffusion when the concentration gradient is reversed and mass transport is from aquitard to aquifer. This study examines these forward and back diffusion phenomena, developing experimental and mathematical approaches to quantify and predict diffusive solute transport between aquifers and aquitards with a variety of initial and boundary conditions.

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