



2008 USDA-CSREES National Water Conference  
Sparks, NV

## **Modeling of Phosphorous Attenuation Mechanisms in Soil Based Septic Systems**

Sarah Christopherson, James Anderson and John McCray

### **Abstract Text:**

Phosphorus (P) from septic systems is often considered to be a water resources problem because of potential eutrophication of sensitive wetlands or other surface-water bodies. For P from septic system effluent to reach surface-waters, the effluent must first infiltrate vertically through the vadose zone before reaching the groundwater, which eventually discharges to surface-water. Ideally, before the groundwater discharges to surface-water, sorption reactions with the soil and P mineral precipitation reactions will have lowered the fluid P concentrations enough to prevent surface-water eutrophication. This research project's goal is to improve the understanding of subsurface transport and transformation of P. In particular, two attenuation mechanisms will be studied, soil sorption of P, and chemical precipitation of P mineral compounds, as well as the synergistic effect. This will be done by performing bench scale column studies and the geochemical modeling software PHREEQC.

### **Impact Statement:**

This project will help to more fully understand the attenuation of phosphorous in soils which will be useful when determining if additional treatment or greater setbacks to surface water are necessary.