

THE MATHEMATICS DEPARTMENT PRESENTS

# A MATHEMATICS COLLOQUIUM

THURSDAY, November 12, 2009

BOND HALL 401

4:00 pm

**Title: Modeling the burrow ventilation behavior of marine sediment-dwelling invertebrates and its consequences for sediment geochemistry**

**Speaker: David Shull** , Huxley College, WWU

**Abstract:** Animals that live within marine sediments maintain burrows that connect their dwellings to overlying water. They ventilate these burrows in order to obtain oxygen for respiration and to flush out metabolic wastes. This activity dramatically alters the rates of solute transport within the sediment, rates of chemical reactions, and the flux of solutes across the sediment-water interface. Quantifying these processes in a way that realistically captures both organism behavior and its geochemical consequences is tricky. I will discuss a set of field measurements on burrow geometries and rates of solute transport from several study sites in Boston Harbor, MA, and discuss how I developed and solved a mathematical model that links the ventilation behavior of bottom-dwelling marine invertebrates and sediment geochemical processes.

Refreshments will precede the talk at 3:30pm in Bond Hall 300.