

ROLLA WATER RESOURCES LUNCHEON SEMINAR

Thursday, October 27, 2011

11:45 a.m. - 1:00 p.m.

U.S. GEOLOGICAL SURVEY

1400 INDEPENDENCE ROAD

ROLLA, MO 65401

Application of Watershed Disturbance Models to Predict and Assess Biological Integrity of Stream Ecosystems

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There is a heightened interest throughout the scientific community in innovative ecological modeling techniques. Many aquatic researchers in stream ecology are currently developing predictive models by including various combinations of landscape based variables (e.g., urban and agricultural land use, land cover, population density, and hydrological alteration, etc.) as a measure of watershed disturbance. These variables then act as the explanatory variables in the models, or the predictors of biological condition at sampled and unsampled stream sites. Biological condition is measured using various metrics, such as EPT richness (number of taxa composed of mayflies, stoneflies and caddisflies), pollution tolerance, % predators, index of biological integrity (IBI), functional species traits, or ordination axes scores. Historically, models relied primarily on multiple regression procedures; however, many newer modeling techniques are being employed, including (1) classification and regression tree (CART) methods; (2) structural equation modeling (SEM); and (3) multilevel-hierarchical models. The relation between watershed disturbance and biological communities will be demonstrated through the use of new quantitative ecological modeling methods for studies examining spatial variability and scale, including: A) development of macroinvertebrate watershed disturbance predictive models for three distinct regions in the western U.S; B) the use of coupled models at two spatial scales (national and regional) to better understand nutrient enrichment in agricultural influenced watersheds for macroinvertebrates and algae; and C) the effect of spatial scale on model performance. Important insights are gained regarding the role of near-stream (riparian) versus whole-watershed conditions as predictive variables.

---Next Luncheon---

Thursday, November 17, 2011

**We need a speaker for next month. If you have a suggested topic, please contact Robert Holmes
(bholmes@usgs.gov)**

Park in the USGS south lot (free parking) and enter the visitor entrance in the southwest corner of the building. For those of you attending the meeting from outside Rolla, you can find directions to the USGS Rolla Center at: <http://mcmcweb.er.usgs.gov/>. The Rolla Water Resources Luncheon is a Brown Bag Lunch event. For those unfamiliar with the area and disinclined to brown bag it, you can find take-out options offerings among the Rolla restaurants found at: <http://mcmcweb.er.usgs.gov/rollamap09ext.pdf>