Distinguishing the effects of local point sources or BMPs from those caused by upstream nonpoint source (NPS) inputs: Refinement of a watershed development index for New England. Detenbeck, N.E., L. Hayes, C. Rosiu, J. Legros, D. Parsley, and A. Sherman. NABS 2011 Annual Meeting, Providence, RI, May 22-26, 2011.

Using EMAP data from the NE Wadeable Stream Survey and state datasets (CT, ME), assessment tools were developed to predict diffuse NPS effects from watershed development and distinguish these from local impacts (point sources, contaminated sediments). Classification schemes were compared to evaluate differences in sensitivity of response: Ecoregions, USFS Ecological Units, Nature Conservancy Aquatic Habitat Classes, and hydrologic regime classes based on predicted peak and low flow statistics. We applied indicator analysis and NonMetric Dimensional Scaling ordination of macroinvertebrate community metrics to narrow down macroinvertebrate community endpoints to a subset explaining most of the variation within each dataset. Potential model variables were filtered using path analysis to determine significant partial effects after spatial autocorrelation and cross-correlations among different land-use metrics were accounted for. We applied boosted regression tree analysis to derive macroinvertebrate community response curves for watersheds with different levels of development. Community metrics from Superfund sites were compared with the predicted 10- and 90%iles from quantile random forest analysis to determine the degree to which sites were impaired beyond what is expected in watersheds with comparable development.

Keywords: watershed development; New England; streams