Distinguishing the effects of point source 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. 34th Annual Meeting of the New England Association of Environmental Biologists, Newport, RI. Mar. 17-19, 2010.

Assessment tools are being developed to predict diffuse NPS effects from watershed development and distinguish these from local impacts (point sources, contaminated sediments). Using EMAP data from the New England Wadeable Stream Survey and two state datasets (CT, ME), we are deriving macroinvertebrate community response curves for watersheds with different levels of development (n = 731 watersheds). Community metrics from Superfund sites are compared with the response curves to determine the degree to which sites are impaired beyond what is expected in watersheds with comparable development. Taxonomy, resolution, and indicator values have been standardized across datasets to facilitate comparisons. Classification schemes are being 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. Six peak-flow classes and three low-flow classes can be distinguished based on watershed attributes. We applied 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. Preliminary analysis for covariance indicated that Ecological Units tended to explain more variation than did Ecoregions, and that the USGS National Urban Intensity Index explained only slightly more variation in models than % impervious area. Both reference condition (y-intercept) and sensitivity to urbanization (slope) can vary by geographic unit and flow regime class. Additional analyses are underway to improve predictive power by including influences of land-use/land-cover at multiple scales, including local NHDPlus catchment and buffer-zone effects.

Keywords: watershed development; New England; streams