

## **Presentation Abstract**

Watershed managers are challenged by the need for predictive temperature models with sufficient accuracy and geographic breadth for practical use. We described thermal regimes of New England rivers and streams based on a reduced set of metrics for the May–September growing season (July or August median temperature, diurnal rate of change, and magnitude and timing of growing season maximum) chosen through principal component analysis of 78 candidate metrics. We then developed and assessed spatial statistical models for each of these metrics, incorporating spatial autocorrelation based on both distance along the flow network and Euclidean distance between points. Calculation of spatial autocorrelation based on travel or retention time in place of network distance yielded tighter-fitting Torgegrams with less scatter but did not improve overall model prediction accuracy. We predicted monthly median July or August stream temperatures as a function of median air temperature, estimated urban heat island effect, shaded solar radiation, main channel slope, watershed storage (percent lake and wetland area), percent coarse-grained surficial deposits, and presence or maximum depth of a lake immediately upstream, with an overall root-mean-square prediction error of 1.4 and 1.58C, respectively. Growing season maximum water temperature varied as a function of air temperature, local channel slope, shaded August solar radiation, imperviousness, and watershed storage. Predictive models for July or August daily range, maximum daily rate of change, and timing of growing season maximum were statistically significant but explained a much lower proportion of variance than the above models (5–14% of total).

## **Speaker Bio**

Dr. Naomi Detenbeck is an aquatic ecologist with the US EPA Atlantic Ecology Division. She received her MS and PhD in Ecology from the University of Minnesota-Twin Cities. Her past research has spanned a wide range of aquatic issues and scales, including acid rain research on nutrient biogeochemistry and benthic algae in lakes, evaluation of best management practices for wetlands in the Prairie Potholes, examination of landscape-scale thresholds of impairment for stream systems, and meta-analysis of factors affecting recovery of aquatic systems. Her current research focuses on quantifying the effects of natural and nature-based (constructed) green infrastructure at the watershed scale and the development of decision support systems.