

## **Using Probabilistic Monitoring Data to Report on the Condition and Stressors of Virginia's Freshwater Rivers and Streams**

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### **ABSTRACT**

The Virginia Department of Environmental Quality (VDEQ) employed a freshwater probabilistic monitoring strategy from 2001 to 2006. This six year period corresponds with Virginia's 2008 305(b) data assessment window. It is important to collect probabilistic data over a multi-year period to reach a sample size that will allow for parameter estimates with narrow confidence intervals and to capture the natural hydrologic variability. During the six year assessment window, VDEQ biologists have evaluated 420 probabilistic monitoring stations and sampled 349 sites. This provides VDEQ with enough data to produce accurate cumulative distribution function curves for hundreds of chemical, biological and physical habitat parameters. Using relative risk and conditional probability techniques VDEQ has determined which stressors pose the greatest risk to aquatic communities. Parameters with screening values and water quality standards were reported in EPA's Assessment Database (ADB) using the probabilistic module.

### **KEYWORDS**

Probabilistic Monitoring, 305(b) Assessment, Relative Risk, Conditional Probability, Biomonitoring