Abstract #222

Virtual Fish

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Biographical Sketches of Authors

Roger E. Stewart II, directs the scientific activities of the Agency's Statewide Water Quality Monitoring Program by establishing the priorities, policies, objectives, and procedures; approves the use of technologies and methodologies; manages complex special projects which result in the establishment of new technologies; presents scientific findings for peer review by the scientific community; manages development of project manuals and guidance; works with the public through formal meetings to establish technical regulations. Roger has established the largest most comprehensive trace clean metals monitoring program among all 50 states.

James N. Huckins has been an analytical chemist with the U.S. Fish and Wildlife Service's (F&WS) Fish Pesticide Research Laboratory now the U.S. Geological Survey since 1970. During this period he developed or co developed a number of widely used analytical methods for organic contaminants, which include Semipermeable Membrane Devices (SPMDs, lead inventor). He is a National Research Council adviser (aquatics committee) for postdoctoral research associates. He has served as an adjunct professor of environmental chemistry at Clemson University, South Carolina. He is the recipient of seventeen research performance awards and has published over seventy peer-reviewed research articles.

Abstract

As part of a Federal grant from the USEPA Mid-Atlantic Integrated Assessment program the Virginia Department of Environmental Quality in cooperation with the US Geological Survey Contaminants Effect Research Center has investigated the occurrence of trace organic compounds in freshwater streams. Many states have adopted water quality standards for anthropogenic bioaccumlative organic toxics. The WQS are generally expressed as a water column concentration not to exceed a four day limit more than once in three years. The standards are generally very low and not easily detected using conventional analytical techniques. Semi Permeable Membrane Devices were selected for this study because they overcome the detection limitations of traditional analytical techniques and they are integrative samplers, representing the average water column concentration over a greater than 30 day exposure period.

Sample locations for the study were based on a stratified random design developed by USEPA EMAP. Know as probabilistic monitoring the one year survey was integrated into the VADEQ's long term probmon program, sampling at approximately 50 different sites each year for a variety of water column chemistry, benthic macro invertebrates, and habitat.

The advantage of a probabilistic design is that for a relatively small number of sites, statewide freshwater estimates of the concentrations of most of the hydrophobic trace organic toxics for which we have water quality standards could be determined.

The results and conclusions will be discussed as well as the significance of new technologies and collaborative efforts between the states, USEPA, and the USGS.