



West Virginia Geological and Economic Survey Colloquium Series

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Place: Large Conference Room behind Publication Sales

Water Quality Regulations and Policies Governing Authority of Testing Treatment and Consumption

Local storm water regulations recently became necessary because of new regulatory programs at the federal and state levels. Our local program must comply with these regulations or face significant civil penalties. Since the passage of the Clean Water Act (CWA), the quality of our Nation's waters has improved dramatically from reduction of point source pollution. Despite this progress, however, degraded water bodies still exist.

The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating Water Quality Standards (WQS) for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1977. Under the CWA, EPA has set water quality standards for all contaminants in surface waters. The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's NPDES permit program controls discharges. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.



Water quality standards are the foundation of the water quality-based control program mandated by the Clean Water Act. Water Quality Standards define the goals for a waterbody by designating its uses, setting criteria to protect those uses, and establishing provisions to protect water quality from pollutants. If monitoring and assessment indicate that for some uses and parameters, a waterbody or segment is not meeting WQS, then that water is considered "impaired" and goes on a special list called the "303(d) list." The 303(d) list should include not only currently impaired waterbodies but also waters believed to be threatened that are likely to become impaired (i.e., not meet WQS) by the time the next 303(d) list is due. Many West Virginia waters contain elevated levels of fecal coliform bacteria; about 17.2% of stream miles in the state have fecal coliform bacteria levels that exceed the criterion of 400 colonies/100 mL. In addition, the aquatic life communities in the headwater sections of many West Virginia waters continue to be impacted by low pH acidic water quality by being exposed to many stressors, including toxic contaminants, sedimentation, nutrient enrichment, and acid preparation. TMDLs (Total Maximum Daily Loads) establish the amount of pollutant to be reduced and assign responsibilities for priority waters to meet state water quality standards. A separate TMDL

is set to address each pollutant with concentrations over the standards. A TMDL establishes the maximum amount of an impairing substance or stressor that a waterbody can assimilate and still meet WQSs and allocates that load among pollution contributors. TMDLs are based on the relationship between pollution sources and in-stream water quality conditions.

GIS is a valuable tool that can be used to calculate loads to a surface water body or to monitor water quality changes within a water body such as a river or bay. A load is the product of flow and concentration, and it refers to how much mass of a chemical enters a system in a specified amount of time. Once the loads to a water body are known, water quality models can be used to determine concentration changes within the water body. Procedures that utilize GIS have been developed for both types of load calculations and for water quality models. GIS helps identify and map critical areas of land use and reveal trends that affect water quality.