SERVICE AREA

Watershed Management: Services and Tools for Resource Managers

The Watershed Approach to water resources and regional wastewater management is increasingly recognized as the most appropriate way to identify problems, assess alternative solutions, and implement targeted corrective actions.

The Watershed Approach involves the use of technology and information to characterize watershed conditions, and to develop sensible, effective and affordable, consensus-based solutions.

Experience, innovation and creativity are essential for developing successful solutions to complex watershed management problems.

Today's watershed managers must consider challenges from multiple land uses and sources of pollutants.

LimnoTech has over 30 years using technologies such as GIS for modeling analyses and data visualization to form solutions at a watershed scale. Furthermore, LimnoTech is a pioneer in the use of adaptive watershed planning to develop integrated approaches to reduce point and nonpoint sources and in the use of green infrastructure for watershed, stormwater and CSO planning. At the same time that resource managers look to watershed-based solutions, funds for management and planning have become scarce. Consequently, it has become essential that experience, creativity, and innovation be applied to the entire watershed assessment and management process.

LimnoTech has over 30 years of experience in applying innovation and creativity in developing successful solutions to complex watershed management problems.

LimnoTech Watershed Management Services

Watershed Assessments

- Watershed characterization (identification, compilation, and analysis of existing data)
- Evaluation of data needs
- Analysis of spatial and temporal trends
- Review, design, and implementation of monitoring programs
- Database development and management
- Identification and characterization of point and nonpoint sources of pollution
- Watershed modeling and pollutant load estimation
- Hydrologic analysis
- Land use planning assistance
- Water quality modeling response
- Fate and transport of toxics
- Evaluation of sediment impacts
- Identification, selection and assessment of BMPs
- Development of Total Maximum Daily Loads (TMDLs) and implementation plans
- Water supply protection
- Regional wastewater assessments and treatment strategies

Supporting Services

- Linkage of GIS and databases with watershed and water quality models
- Visualization of data and model outputs
- Stakeholder involvement
- Pollution trading

The following project descriptions offer a sampling of LimnoTech's experience in helping our clients resolve the challenges of watershed evaluation and management.

Agricultural Management Watershed Model. The Maumee River Basin is the largest tributary source of suspended sediment to Lake Erie. To help reduce erosion from this agricultural watershed, LimnoTech developed and applied the Annualized Agricultural Non-Point Source (AnnAGNPS) watershed model to the Blanchard River tributary watershed to simulate erosion and sediment delivery pathways and loads; simulate fate and transport of nutrients; and project potential benefits of conservation strategies and best management practices. The model will be used to evaluate agricultural management practices, and performance of land treatment (site-specific conservation practices) on reducing erosion and sediment and nutrient delivery.

LimnoTech's decision-support tool allowed the client to evaluate various options to prioritize control actions.

Watershed Characterization and Planning to Help District Meet Consent Decree. Sanitation District No. 1 of Northern Kentucky signed the nation's first wet weather consent decree based on the principles of adaptive watershed management. LimnoTech is working with the District to develop watershed plans that meet requirements of the Consent Decree for sewer overflows. LimnoTech is providing watershed characterization and planning services to develop a comprehensive characterization of the District's service area to support implementation of cost-effective water quality improvement projects. These efforts include planning, database management, geographic information system (GIS) mapping, watershed assessment, and detailed watershed and water quality modeling. LimnoTech also developed a Watershed Assessment Tool that aggregates information throughout the District's service area and rates point and nonpoint sources in terms of their potential to generate pollutant loads.

Ellerbe Creek Watershed Management Implementation Plan. The Ellerbe Creek watershed is a predominantly urban tributary to the upper Neuse River Basin in Durham County, NC. The watershed is on the 303(d) list for biological impairment, and is expected to be listed for fecal coliform. LimnoTech was part of a team providing professional watershed planning and design services to assist the City in completing the watershed management plan. LimnoTech evaluated best management practice impacts, and assessed potential benefits of low-impact development. Modeling results indicated that water quality improvements are feasible in the Ellerbe Creek watershed, and that compliance with bacteria and nutrient standards can be achieved.

Upper Patuxent River Watershed Field Assessment. The Upper Patuxent River watershed in Anne Arundel County, MD, flows into Chesapeake Bay. As part of its NPDES municipal separate storm sewer system permit, the County was required to perform an assessment of land use conditions within the watershed. The goal was to determine where to focus resources to maintain waterbodies in good condition, and to assess where mitigation of potential problems was necessary to improve overall watershed health and quality. LimnoTech provided data for the 19 subwatersheds within the river basin by performing physical habitat condition assessments, base flow sampling, stormwater facility mapping, and Rosgen Level I and II classifications for 400 miles of stream reaches. This information was used to develop priority rankings of stream reaches and subwatershed areas, and ultimately to inform decisions on land management and restoration and preservation activities.

Croton Watershed Strategy Support. The New York City Department of Environmental Protection (NYCDEP) has researched current and future risks to Croton Reservoir water quality and investigated management strategies to ensure source water protection as growth occurred and regulations became increasingly stringent. LimnoTech developed a GIS-based decision-support tool to allow decision-makers to evaluate various point and nonpoint source controls and their impact on water quality in the watershed. With the decision-support tool, NYCDEP was able to prioritize its watershed monitoring, modeling, protection and restoration efforts and provide local stakeholders with technical information for their own watershed programs.

LimnoTech's modeling showed the value of best management practices and low-impact development.