

Water Resource and Supply Services



Water suppliers and large-quantity users are under increasing pressure to assess availability and potential contamination in their watersheds, to conduct vulnerability assessments, and to develop comprehensive source water assessment plans (SWAP) for their watersheds. In addition, drinking water suppliers have a host of new regulations to deal with, including the Interim Enhanced Surface Water Treatment Rule, Disinfectants/Disinfection Byproduct Rule, and the Groundwater Rule.

These new requirements demand that water suppliers and users look more carefully at their watersheds, including microbial and chemical sources of contaminants and processes that may influence source water availability and quality, including the effects of climate change. In addition to traditional treatment plant operations, water suppliers must now consider not only pollutant sources, but also transport mechanisms, chemical and biological reactions, and security and climate change risks.

Since 1975 LimnoTech's has been applying innovation and creativity to model and characterize watersheds, and developing solutions to complex water management problems, ensuring that successful solutions are found for our clients' water protection needs. The critical issues addressed encompass the sources, fate, and transport of

pollutants of specific concern for drinking water suppliers, including nutrients, pathogens, metals, and pesticides. In addition, LimnoTech's origins in eutrophication modeling are extremely relevant to addressing algae, taste & odor, and total organic carbon (TOC) issues.

LimnoTech's Water Supply Services

- Source water assessment planning
- Drinking water vulnerability assessments
- Contaminant source identification
- Drinking water regulatory support
- Monitoring programs
- Database development and management
- Analysis of spatial and temporal trends
- Watershed and water quality modeling
- Reservoir eutrophication studies
- GIS interfaces for database information
- Fate and transport modeling
- Time-of-travel assessments
- Evaluations of potential climate change impacts.

The following project descriptions offer a sample of LimnoTech's experience in helping our clients meet the challenges of water resource and supply management.

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



Water suppliers must consider pollutant sources, transport mechanisms, chemical and biological reactions, security, climate change risks, and more to provide sufficient water supply and quality.

Remedial Investigation, Feasibility Study, Remedial Action for Chlorinated Solvent Impacts, Fayette, Ohio.

LimnoTech is involved in a remedial investigation and feasibility study for a former manufacturing site in Fayette, OH. Groundwater beneath the site was impacted by a release of chlorinated solvents, resulting in a plume of trichloroethylene and other chlorinated volatile organic compounds. The site is surrounded by non-industrial development, and the municipal water supply wells were located a short distance downgradient. LimnoTech has provided a range of services including remedial investigation activities; a human health risk assessment; completion of a feasibility study; hydrogeologic investigations for relocation of the municipal water supply wells; design and implementation of interim remedial actions for the site; and bench and pilot tests to evaluate the use of in situ chemical oxidation at the site.

Support for Fairfax County, Virginia Popes Head Creek Watershed Study and Plan.

Fairfax County implemented a Stream Protection Strategy (SPS) that addresses planning and redevelopment in the County while mitigating the harmful effects of increasing urbanization (i.e., stream channel erosion, loss of riparian buffers, decreased aquatic life, and poor water quality). The SPS study found that elements of watershed health were in decline. The County sought to identify areas of the County where impacts were the greatest, and to determine what measures could be implemented to mitigate those impacts. LimnoTech developed a multi-task work plan that addressed the anticipated needs of Fairfax County in the implementation of the SPS and development of the watershed management plan.



We employ our experience and expertise to develop watershed characterizations to solve complex water management issues.

Identifying Knowledge Gaps with Total Maximum Daily Loads (TMDL) and Drinking Water Utilities.

The drinking water community expressed a need for a role in the TMDL process. By participating in the TMDL process, utilities can leverage the TMDL outcome and potentially reduce costs for treatment, improve water quality, and reduce health risks. This participation would also improve the effectiveness and reduce costs for source water assessment and protection plans. This project sought to define a role for utilities in the TMDL process and to improve communication between regulatory agencies and drinking water communities.

LimnoTech teamed with Technology Planning and Management Corporation, a nationally recognized expert in drinking water issues, to identify gaps in knowledge of TMDLs and drinking water utilities; identify benefits and impacts to water utilities from TMDLs; open communication between regulatory agencies and drinking water utilities; and identify TMDL research needs to support drinking water utilities.

The Project Team conducted a workshop to explore the benefits and obstacles of participation by drinking water utilities. The study explored the relationship between watershed management and drinking water source water protection. The final report described benefits and costs of involvement, recognized key issues, and identified research needs.

Colorado River Environmental Models – Phase 2 Lake Travis Watershed Hydrologic and Water Quality Monitoring and Modeling Study.

Lake Travis is the largest reservoir within a chain of six lakes on the Lower Colorado River known as the Highland Lakes. The reservoir provides flood control, drinking water, power, recreation, and irrigation water for agriculture. Its watershed is rapidly being developed from forest and agricultural to residential usage, bringing additional water supply demand, wastewater flow, and nonpoint source runoff. LimnoTech was selected to provide technical assistance to the Lower Colorado River Authority to develop a Phase 2 watershed model and to

provide guidance in its application and linkage to a Phase 2 water quality model being developed. The models were used to evaluate a variety of water resource management and development scenarios. This project accomplished the following tasks: 1) describe present water quality conditions; 2) define contribution of pollutants from the watershed; 3) evaluate the impact of those contributions; and 4) estimate the change in pollutant loading (and water quality) in response to land use changes and management alternatives, including best management practices (BMPs) to control pollutant runoff from existing land uses and future development areas.