

## Water Stewardship and Sustainability

**Human alterations and demands on freshwater resources are growing rapidly. This is creating concerns about water scarcity and water quality, which can affect society, industry, and the health of aquatic ecosystems. Climate change will likely compound these problems. Our challenge as water professionals is to ensure that clean and sufficient water is available to support economic and social prosperity and to sustain freshwater ecosystems.**

While we integrate the concepts of sustainability into our own business and all our projects, LimnoTech provides a specialized service area focused on Water Sustainability in three key areas:

- Corporate water stewardship
- Sustainable communities/green design
- Sustainable agriculture



We work with many different client sectors in these three areas, and they tell us that they benefit from our broad expertise. We help cities plan and design green infrastructure to create sustainable, livable communities and healthy waterways while meeting regulatory requirements cost-effectively. We work with corporations to better understand water use in operations and the supply chain, and identify and quantify the benefits of reducing uses, minimizing risks, and mitigating impacts. We help power utilities better understand the complexities of the water/energy nexus and the potential benefits of sustainable water supply solutions such as water-efficient cooling technologies, reclaimed water sources, and collaborative



watershed-based approaches for improved resource management. We work with agribusinesses to help them optimize their operations with limited water quantity and quality impacts.

Our clients require sustainable solutions that are grounded in the latest developments in water science and technology. Bringing new knowledge and tools to bear on complex problems has been a hallmark of our work since 1975.



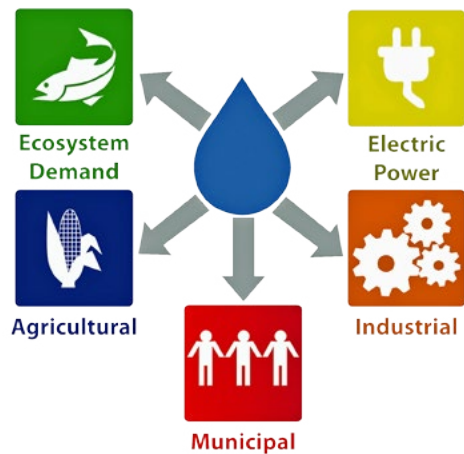
### Selected Project Summaries

LimnoTech is supporting the water stewardship efforts of global corporations, agencies, and non-governmental organizations. A few of our projects are summarized below.

***Support to The Coca-Cola Company's Water Stewardship and Water Resource Sustainability Efforts.*** In collaboration with The Nature Conservancy, LimnoTech is supporting Coca-Cola's water stewardship initiatives and commitment to its long-term Replenish goal set in 2007. LimnoTech is quantifying the watershed restoration benefits generated through Community Water Partnership (CWP) projects across the globe. LimnoTech also prepared user-friendly guidance documents on CWP projects that incorporate information on selection of locally relevant projects and data requirements and methods for quantifying benefits. The team supports Coca-Cola in conducting a series of international "Replenish workshops" to help its business units and bottlers understand the CWP program and quantification methods, and how to be more strategic in the selection of future projects.

**Technical and Strategic Support to World Wildlife Fund for Freshwater Conservation.** LimnoTech conducted two workshops in China and is currently providing support related to selection of freshwater conservation and restoration projects and water benefit quantification.

**Water Prism Decision Support System.** With support from the Electric Power Research Institute (EPRI), LimnoTech is developing a decision support system (Water Prism) to evaluate benefits of multi-sector water-saving strategies. Although Water Prism will support decision-making for power plant siting and retrofit options, it is not limited to water planning solely for the electric power sector. Water Prism scenarios are constructed to explore how the implementation of various water-saving strategies may result in a shift of the demand curve so that water needs will be met within the bounds of available supply. Strategies may include nonpotable reuse, in-plant reuse, indirect potable reuse, advanced cooling technology for power plants, improved irrigation efficiency, and desalination.



**Optimizing Industry Water Use: A Water Footprinting Study.** LimnoTech, in collaboration with the Council of Great Lakes Industries (CGLI) and other partners, is evaluating the Alliance For Water Stewardship Standards, water footprinting, and related water stewardship initiatives to understand what these emerging efforts mean to industries and individual companies operating within the Great Lakes Region. LimnoTech supported the testing of the metrics utilized by these water stewardship initiatives at five Great Lakes industrial facilities to address key objectives and contribute to the evolving science.

**Water Footprint of a Kraft Foods' Dry Mix Beverage Product.** LimnoTech and The Nature Conservancy conducted a screening-level water footprint analysis for a dry mix beverage product produced in Brazil and Mexico. The work highlighted that most water consumption is associated with the supply chain, and the team is working with Kraft to identify measures to improve efficiency measures associated with sugarcane production.

**Development, Execution, and Documentation of Water Footprint Assessments for Jain Irrigation Systems.** As a member of the Water Footprinting Team of the International Finance Corporation (IFC), LimnoTech supported a water footprint assessment with Jain Irrigation in India that allows the company to measure its water footprints and assess the sustainability of its water use. Jain Irrigation has pioneered water conservation and the use of water-saving devices.



**Water Footprint Assessment of The Coca-Cola Company's Orange Juice Products.** LimnoTech conducted a water footprint assessment for two of Coca-Cola's orange juice products. The work involved collection and synthesis of a significant volume of data and information on Coca-Cola's water use at its plants and a complex supply chain that spans four countries. The results were discussed in a report authored by LimnoTech and The Nature Conservancy and released by The Coca-Cola Company on the practical application of water footprinting.

#### Improved Management through Latin American Water Funds

The Nature Conservancy, working with FEMSA and other partners, is developing financial tools called Water Funds that gather investments from water users and direct the funding toward conservation upstream in the watershed where water supply is filtered and regulated. Water funds also preserve habitat for native plants and wildlife. Investors are primarily large businesses and government agencies who view the funds as a mechanism for minimizing treatment costs and reducing the chance of water shortages in the future. By applying modeling tools ranging from simple to complex, LimnoTech has quantified the water quantity and water quality benefits of various watershed interventions including land protection, reforestation, and improved grazing practices for TNC, FEMSA, CM Heineken and PepsiCo MX.

**Development of a Green Build-Out Model to Quantify Stormwater Benefits of Green Infrastructure.** Washington, D.C. sought to reduce its volume of wet weather runoff to ease the burden on existing infrastructure by using green infrastructure practices. LimnoTech worked with the Casey Trees organization to develop the Green Build-out Model and later the Enhanced Green Build-out Model to calculate potential reductions in stormwater runoff and CSO discharges resulting from the application of green infrastructure practices. Findings showed that use of these practices would generate significant reductions in stormwater runoff volume. The research provided an innovative and powerful planning tool for stormwater management in the District.



**Development of a Great Lakes Watershed Ecological Sustainability Strategy.** LimnoTech, in collaboration with The Nature Conservancy and Michigan State University, developed key aspects of a Great Lakes Watershed Ecological Sustainability Strategy (GLWESS) within the agricultural regions of the Great Lakes. The strategy calls for identifying and quantifying the extent to which watershed restoration actions for a given watershed will reverse or mitigate the impacts on water quantity, water quality, and biological communities, and will improve watershed and coastal ecosystem function. This project examined the potential for three categories of market-based transactions to successfully implement the strategy. This was accomplished through the development of tools to quantify the ecological benefits of agricultural BMPs, optimization of their deployment in a given watershed, and exploration of the concept of agricultural certification and the testing three transactions to encourage implementation of these activities in the Great Lakes basin.

**Development of Water Benefit Certification Drip Irrigation Methodology.** LimnoTech developed a methodology for Water Benefit Certificate (WBC) projects that replace water-intensive irrigation techniques with drip irrigation systems to increase water productivity. LimnoTech participated in a workshop and site visit in India where the methodology is being tested. The work supports the WBC mechanism under development by First Climate and the Swiss Agency for Development and Cooperation (SDC), who have set up a Public Private Partnership called "Water Benefit Partners." This mechanism will allow water project financing to be linked to measurable and verifiable project benefits.

**Agricultural Management Watershed Model for Blanchard River Watershed.** LimnoTech developed and applied the Annualized Agricultural Non-Point Source model (AnnAGNPS) model to the Blanchard River Watershed, a major sub-basins in the Maumee River Basin, Ohio. The primary goals of the project are to explore and prioritize agricultural management practices; to simulate erosion, sediment delivery pathways, and sediment delivery loads in the watershed; simulate fate and transport of nutrients; project benefits of conservation treatment strategies and best management practices; and support efforts to reduce erosion and sediment and associated nutrient delivery to Toledo Harbor and Maumee Bay.

