



Shown here and above is the Sewanee Utility District's land application system and lagoon (top photo). (Photos courtesy of Dennis George)

Center Researchers Work with Sewanee Utility District to Determine Effectiveness of Land Application System

The Sewanee Utility District (SUD) Wastewater Treatment and Land Application Facility, near Sewanee, Tenn., has been the site of a recent project – funded by the SUD – in which Dennis George, environmental engineer and director of the Center for the Management, Utilization and Protection of Water Resources; Martha J.M. Wells, environmental chemist; and Divya Edison, graduate student, have been determining the effectiveness of its land application system.

The practice of land-applying treated wastewater is one of the methods that utilities throughout the United States use to manage wastewater through cost-effective, environmentally sound techniques.

"In this project, the SUD wanted us to determine which water quality parameters persisted in the discharge from its lagoons and should be removed by the land application system under proper operation and maintenance of the irrigation system," George said. "The selected parameter, if present in waters leaving the SUD land application site, may indicate that the soil-water-plant matrix is inadequately treating the lagoon effluent."

One of the steps in the project was to use statistical analysis to determine water quality parameters, like the ratio of nitrogen to phosphorus found in the water system, in the land application effluent that were significantly different from water quality parameters in surface waters entering and leaving the irrigation site. If water sources are high in nitrogen, phosphorus or micronutrients, algae can form, which can negatively affect the habitat of the aquatic life that inhabits that region.

"One of the things we recommended after analyzing our data," George said, "was to monitor the nitrogen-to-phosphorus ratios to limit algal productivity. Also, nitrate to nitrogen concentrations in the surface water leaving the land application system should be limited."

The SUD project ended with a complete report of the team's findings, but according to George, further investigation is needed to determine whether there are other issues with flow seeping through the lagoon dikes.