



Case Study: SJWD Water District

Using Geospatial AI to help improve dam safety



Water SAT – Dam Monitoring

Overview

SJWD Water District is a public water utility located in Spartanburg County, South Carolina. Created in 1956, the organisation owns five dams. Four of these structures are considered high hazard with significant consequences and high potential for loss of life or infrastructure damage in the event of a failure. From its establishment almost six decades ago, the district has grown significantly. Today, the service area covers approximately 168 square miles and around 2.2 billion gallons of water is treated at the SJWD Filtration Plant annually.

The Challenges

Already serving a rapidly growing population of approximately 70,000 people, the company has seen its customer base grow by an average of 5% every year for the last five years. Emergency action plans were prepared in the past for all the dams, running a dam breach scenario to determine areas that could potentially be inundated.

Today SJWD is witnessing more subdivisions and commercial properties that are outside of what is traditionally considered a flood zone, but they're inside potential inundation areas should one of the dams break. In addition to the increased consequences of failure associated with growing urbanisation downstream, a recent flooding event prompted a reappraisal of its approach to managing dam risk.

In 2015, South Carolina witnessed a severe state-wide event, which included dam failures in the lower part of the state. These dams were not necessarily high on the radar for the regulatory agency on their own. But when they failed at the same time this caused a catastrophic failure and raised awareness of the potential impact of dam failures.

The Solution

Recognising the increased necessity of staying ahead of potential failure, the state regulatory agency, the South Carolina Department of Health and Environmental Control (SCDHEC), approached SJWD as a potential partner to use the Rezatec dam monitoring tool on two of the company's dams, at Lyman Lake and Lake Cooley. These two dams are both earthen structures, one being built in the 1950s and the other in the 1970s.





“When you can combine that amount of data over a broad scale with the AI capabilities, that’s a pretty powerful combination for infrastructure owners.”

Billy Cothran, CEO, SJWD Water District

SJWD wanted to use the technology to monitor any changes that could impact the integrity of its dams. The Rezatec solution provides the ability to see the whole dam, across a vast area, in more granular detail using data captured via satellite. Minor changes and anomalies in motion and vegetation (a sign of seepage) can be detected, with advanced AI-powered algorithms flagging areas of concern. Rather than replacing inspections, the technology enhances decision making by providing new insights comprising regularly refreshed data with millimetric accuracy. This has empowered SJWD with knowledge on its dams and enables better planning for capital improvements.

Accurately Identifying Risk

Both SJWD and SCDHEC receive monthly updates which accurately flag any potential issues that may arise. For the regulator, this means enhanced data between inspections that enable correct dam classifications and safer dam infrastructure. South Carolina DHEC is provided with a greater level of confidence in the efforts taken to monitor assets that could have large potential impacts if not properly managed and maintained.

While for owner SJWD, public safety and efficiency can be drastically improved. Data on ground motion and seepage, as well as new housing developments, ensures engineer resources are directed to the right place at the right time. This not only saves on costs but helps to reduce the risk of dam failure.

Starting the monitoring program in December 2020, early results show the technology is helping SJWD to identify anomalies that would otherwise go unnoticed. For example, in one dam in particular, the technology identified an area that had stayed wet, typically suggestive of seepage. Another dam being monitored experienced a partial failure of the emergency spillway due to flooding in early February last year. Despite being a construction site during the early parts of the program, the Rezatec solution picked up these changes.

“The more information we have the better it helps us prepare and plan for when we actually do need to spend that money for any necessary repairs and improvements. The data provided by Rezatec will allow us to cost-effectively monitor our dams.”

Billy Cothran, CEO, SJWD Water District