Rezatec
Analyzing Earth Data

USING EARTH OBSERVATION DATA TO IDENTIFY AREAS OF INFRASTRUCTURE AT RISK OF FAILURE AND INTELLIGENTLY DEPLOY GROUND-BASED DETECTION DEVICES

Case Study: Henry County Water Authority

THE PROBLEM

Henry County Water Authority in Georgia, USA, has been proactively engaged with water management consultants in an 11-year program of leak detection by surveying and monitoring 1,400 miles of its pipeline. This has traditionally been reliant on acoustic leak detection methods including the deployment of noise loggers and other acoustic listening devices. However, these ground-based methods of monitoring Henry County's extensive water catchments and infrastructure have their limitations.

Not only are these methods costly, time-consuming and resource-heavy, but they're difficult to deploy over large and sometimes remote areas. Henry County Water Authority, along with their water management partners, Matchpoint, have moved to change this by incorporating Rezatec's satellite data analytics service to further optimise existing processes by identifying risk of leakage across their network.

The impact of a leak is enormous, involving parts of the water supply being shut off, time and money being spent repairing not just the leak but the road and other infrastructure affected by it, and dealing with the resulting insurance claims and regulatory fines. What's more, with the completion of Level 1 water loss audits mandatory each year, it's in Henry County's interests to improve on its current water loss rate of around 10%.

By involving Rezatec and making use of its detailed Earth Observation data, the main aim of the Henry County project was to predict where pipeline failure was more likely to occur, allowing the intelligent deployment of ground-based detection devices to these high-risk areas. In particular, Henry County was interested in identifying areas of concern on PVC mains and services, as these pose a particular challenge to acoustic leak detection.

HENRY COUNTY
WATER AUTHORITY

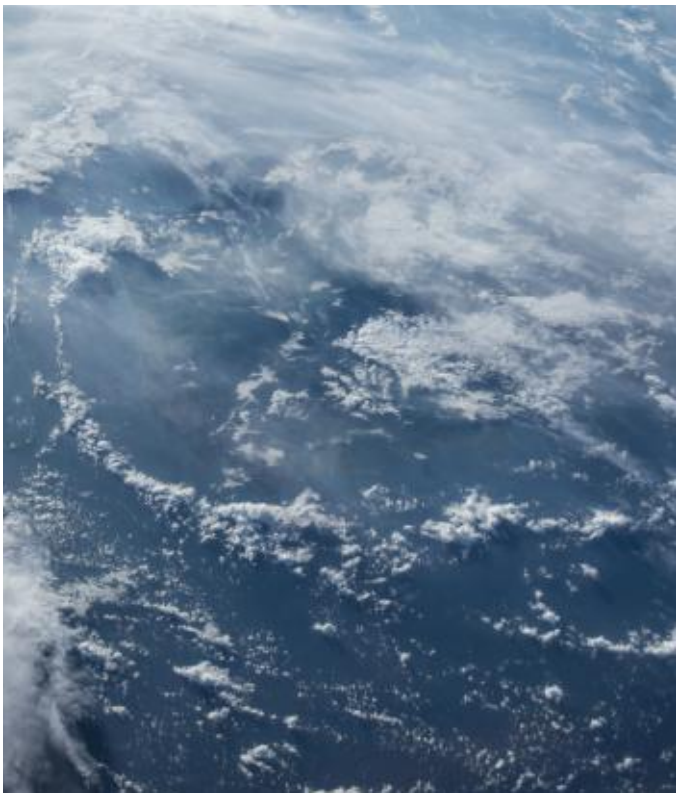
THE SOLUTION

Rezatec stepped in to provide a complementary service to Henry County's existing acoustic leak detection work. While the thinking behind the project was initially simply to reduce leaks, it became clear during the project that Earth Observation data could add most value by predicting risk, identifying the likeliest points at which Henry County's assets could fail. This would allow Henry County and their leak detection team to deploy their ground-based devices more effectively, as well as giving them the intelligence they needed to plan infrastructure investment and repairs to prevent future leaks.

The project, which is ongoing, has had two main phases so far:

PHASE 1: Pipeline leak detection

The project initially looked for indicators of asset failure in the potable water supply, looking out for telltale signs of leaks, such as vegetation vigour and terrain motion. It also assessed topological and hydrological data and reviewed historic leak data and pipeline information.



THE SOLUTION

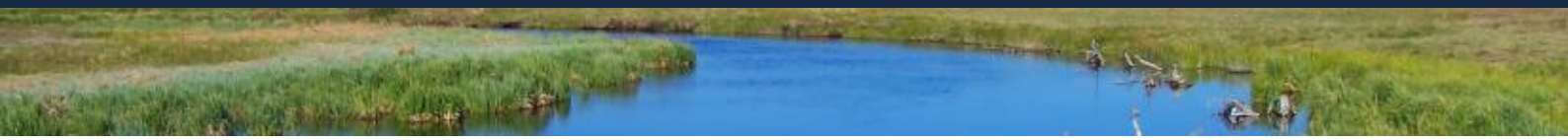
PHASE 2: Infrastructure risk assessment

Risk assessments were then identified as a more pressing concern, given their ability to identify high-risk areas of the Henry County infrastructure before leaks occurred. These start by looking at key causes of pipeline failure, including:

+ Terrain motion
+ Vegetation intrusion - particularly relevant to the more vulnerable sewer network, which comprises unpressurised clay pipes
+ Disturbance as a result of human activity
+ Pipeline attributes - such as age, material and diameter (larger pipes being most at risk)
+ Historic failure events - including location, volume and the nature of the failure

Statistical analysis then integrates these attributes into a model to classify pipeline segments based on the relative risk of future incidents. Each section of pipe is given a cumulative pipeline risk, with overlapping reporting areas created along the pipeline network and a combined pipeline risk calculated from intersecting pipelines. Once high-risk areas are identified, acoustic monitors can be strategically deployed to monitor them.

In time, the aim is to create automated alerts to newly identified 'hotspots', visualising the information through a user-friendly portal with data that can be conveniently exported into other GIS and workflow tools.



KEY BENEFITS AND OUTCOMES

"Matchpoint and Rezatec have helped aid our efforts in nonrevenue water management by adding another tool to our tool bag. The Rezatec satellite asset management survey has helped verify and improve our current leak detection processes."

Brock Biles, Henry County Water and Sewerage Authority

"The data from Rezatec has helped us take a more intelligent approach to infrastructure assessment and non-revenue water management, enabling us to integrate the data with our GIS tools and to deploy our own technologies with greater precision in the areas most at risk."

Matchpoint

While the project is ongoing, the more focused approach already enabled by Rezatec's infrastructure risk assessments has big implications for the effectiveness with which Henry County can manage its catchments and infrastructure. The Rezatec project is giving Henry County the intelligence needed to be more proactive, mitigating risk by preventing leaks before they occur and cause major disruption.

By allowing better deployment of ground-based leak detection resources, the Earth Observation data should also help reduce the cost of monitoring such an extensive pipeline network. And, by sharing the results with the wider industry, it's hoped that similar projects will help other utility companies to benefit from this technology in due course.

If you would like to learn more about Rezatec, please visit our website www.rezatec.com. Alternatively contact us on 01865 817500 or info@rezatec.com to book a demo of our geospatial intelligence platform.