

# Esri News

## for Water & Wastewater

Summer 2013

## Building Atlanta's GIS

By Dax Flinn, City of Atlanta, Department of Watershed Management, and Ryan McKeon, Wachs Utility Services

Atlanta, Georgia, the ninth-largest metropolitan area in the United States, has one of the biggest and oldest water systems in the country. As such, the city delivers water to more than one million customers through a network of 2,700 miles of pipe. Three water treatment plants (WTPs) serve the system. The service area consists of three pressure zones. The system includes water mains ranging from 2 to 72 inches in diameter, and some of the pipes are 90 years old.

In a strategic effort to sustainably rehabilitate its aging system and increase system control, the city decided to implement a series of steps to fundamentally improve the Department of Watershed Management's (DWM) infrastructure and work toward

integrating its GIS with its current legacy and enterprise systems. To accomplish this, DWM embarked on a series of major initiatives, which advanced the GIS program and allowed it to provide a platform not only for web-based viewing capabilities but also for real-time field reporting and updating. To achieve this goal, it first initiated an ambitious and creative project in 2009 with the Valve and Hydrant Asset Assessment Program.

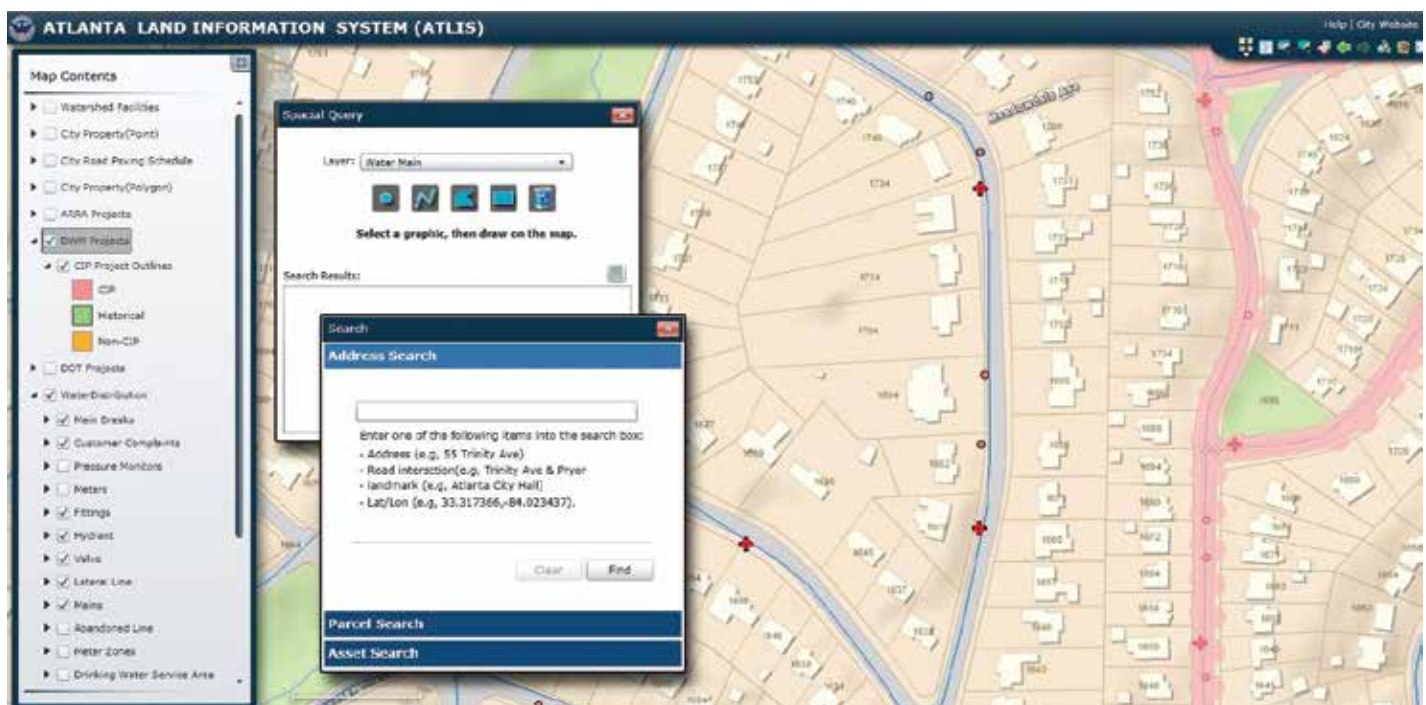
### Valve and Hydrant Asset Assessment Program 2009–2012

For the first phase of this project, DWM worked with Wachs Utility Services (WUS) and Brindley Pieters & Associates and used ArcGIS technology from Esri to focus on increasing

asset usability. This included the inventory, repair, and documentation of 80,000 water valves and fire hydrants in the system. This first phase was completed in early 2012, and while it was widely regarded as successful, there remained an opportunity to increase information usability. Through 2012, the primary information system of record was an atlas of nonscaled plat card drawings. There had been a previous effort in the 1990s to migrate from paper to GIS, but data quality challenges prevented the idea from gaining wide acceptance, and it eventually fell by the wayside.

To make full use of GPS and asset data captured in the first phase of the project, DWM commissioned a team of professionals

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↑ The City of Atlanta's web mapping application provides an easy way to view information.

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# Serving Customers with a Mobile Work Order System

## Elsinore Valley Municipal Water District Goes Paperless

By James A. Ollerton, Water Employee Services Authority

Elsinore Valley Municipal Water District (EVMWD) has provided water service in California's Riverside County for 55 years. EVMWD covers a 96-square-mile area along the Interstate 15 corridor and has approximately 40,000 water, wastewater, and agricultural services satisfying a population of approximately 133,000. It is anticipated that water demand will double within 10 years. EVMWD employs 160 dedicated staff.

In 2009, EVMWD went live with a customer information system (CIS). This robust system was designed to handle a number of customer service workflows including the issuing and processing of service orders. Over the next year, the district identified areas in which it would like to improve the CIS workflow process. For example, a service order (SO) would be completed in the field and subsequently processed back in the office.

At the time, the procedure was to generate an SO in the CIS, then print it out and hand it off to the field personnel who would cover a designated area of the district. The field personnel would then fill out information on the paper forms, and at the end of the day that information would have to be reentered into the CIS manually by a dedicated staff member. This created a situation of duplicate data entry. Another challenge faced was when new service orders and updates came in throughout the day, there was no easy mechanism to get that information out to the field other than a phone call or summoning the field staff back into the office. With an area of 96 square miles, this became a logistics nightmare.

"We are looking to save time by not having to complete the service orders in the office and instead completing them in the field," said Tammy Ramirez, meter services superintendent. "We need a mechanism to move information out to the field and then back into the CIS in a more streamlined manner."

The goal now was to look for a commercial off-the-shelf (COTS) mobile workflow solution that would integrate with the CIS and solve the aforementioned issues. The district also



↑ Field Mapplet Mobile Highlighted Service Order

had interest in discovering a solution that could satisfy additional criteria. The district had a well-developed Esri-based GIS and immediately realized the benefits of a solution that would take advantage of the GIS data. A computerized maintenance management system (CMMS) was in place that was in need of a GIS-based mobile component. The district wanted a single mobile solution that could address other field crew activity that did not relate necessarily to the CIS or CMMS. As can be seen from the criteria pattern so far, it can be said that the district was looking to support one mobile solution, thus reducing the internal administrative challenges of supporting multiple platforms. Finally, cost was a key factor from a licensing standpoint, in addition to the services involved, to do what was needed.

EVMWD briefly considered the idea of having the CIS accessible out in the field through remote connection but quickly rejected this idea due to a similar pilot effort

for remote connection of the CMMS. It was decided from this pilot project that critical workflow applications out in the field should be able to perform in disconnected mode. The district also was considering a mobile solution sold as a separate module from the CIS. It would satisfy the immediate need of the CIS workflow issues but fell short of all the other additional criteria. The district also looked at other mobile platforms but was either not impressed by the workflow architecture or felt that the level of expertise was only in niche workflows handled through the system and would require major costs from an additional consultant to make an integration successful.

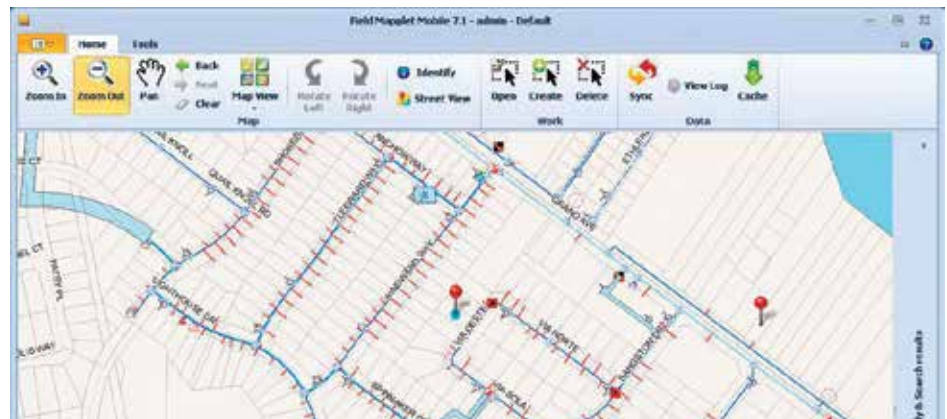
Ultimately, EVMWD selected the Field Mapplet solution from Spatial Wave. EVMWD's long history of involvement with Esri's Water/Wastewater group helped the district learn of Spatial Wave. After Spatial Wave had shown to the district the solution and approach that it would take

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for integration, it was decided that this was the right way to go. Another key factor that played a role was the fact that the Field Mapplet solution was GIS based and would take advantage of the district's mature geodatabase. Another feature was the ability to take advantage of ArcGIS web services and the ability to execute ArcGIS geoprocessing tasks.

"The GIS-based solution has helped in areas where I didn't even realize there could be improvement; for example, the console



CIS: 20130207\_QFV30EF

SO #: 170778 Original SO Type: DELINQUENT RECHECK Flag: (none) Complete Attachments (0)

New SO Type Description: DELINQUENT RECHECK New SO Type: DLNQ

**Service Order Summary** **Completion Details**

Date Created: 2/7/2013 3:40 Date Scheduled For: Requested by: Assigned to:

SO Notes:

**Service Address Information**

Service Address: 33105 VIA OESTE, LAKE ELSINORE, CA 92530-1454 Cycle/Route: D&A

Tract No: Lot No: APN: 381341018 Book: 603

**Customer Account:**

Account #: 031263 Account Type: RE Account Status: AC

Name: LISA ESPINOZA Business Phone: Move In Date:

Home Phone: 9516789031 Cell Phone: Move Out Date:

**Current Meter Information:**

Meter #: 66430662 ECR #: 59252419 M&U #: 12738506

Dial Size: 4 Date Meter Installed: 9/11/2006 12:00:00 AM

Size: .75 Last Read: 2559.00 Last Read Date:

**12 Months Reading Usage History: 2012**

Usage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Usage	29.00	16.00	15.00	17.00	12.00	23.00	35.00	24.00	23.00	29.00	17.00	22.00
Read	2314.00	2330.00	2345.00	17.00	2374.00	2397.00	35.00	2456.00	2479.00	29.00	2525.00	2547.00

Hide/Show Location Info Print OK Cancel

↑ Field Mapplet Mobile Highlighted Service Order

In addition, EVMWD is taking full advantage of all the other extensions of Field Mapplet including valve exercising, advanced fire flow testing, underground service alerts, redlines, and soon-to-be-implemented sewer line cleaning. Also, EVMWD anticipates soon having the Field Mapplet mobile GIS solution completely integrated with the CMMS. With all this spatial metadata now being collected and more to come, the district has wasted no time in developing reports and GIS viewing services that display the data in a manner that only engages the staff better and helps them understand more about what is going on at the district.

GIS has enabled the district to implement a unified mobile solution to process customer service workflows, CMMS work orders, and other field workflows, such as underground service alert ticket processing, which are not managed by these systems. In addition, Field Mapplet has replaced the district's hard-copy facility atlas data with a robust electronic mobile atlas while allowing for redlining of the data. Combining Esri technology and the Spatial Wave solution has resulted in optimizing district resource utilization while continuously improving the quality of the GIS.

↑ Service Order Summary Form in Field Mapplet

is a good managing tool where I can gauge work visually with the GIS map and reallocate work as needed," said Carol Mallard, billing specialist.

Now, district field services representatives have full access to the robust GIS database and construction drawings. Ultimately, the GIS solution enabled the field crews from both CIS and operations departments to obtain and perform their work in the field. Some of the key capabilities of integration with CIS included the following:

- The exchange of information between CIS Infinity and Field Mapplet was in real time. Customer service requests will show up on the mobile units after synchronizing the unit.
- The process of creating service orders in CIS Infinity passed the information to Field Mapplet in order that a service request can be created in Field Mapplet.
- Service orders could now be delegated easily by area of responsibility.
- Mobile printer configuration allows printing of labels and door hangers on the fly, out in the field.
- Route optimizing saves time and resources.
- The process of completing service requests in Field Mapplet passed information to CIS in order that the service order can be completed and the meter info can be updated in CIS.

# "If You Build It, They Will Become Aware"

## Integrated Web Map Aids Sandy Relief Efforts

By Jessica Wyland, Esri

It started as a free, public sewer infrastructure map for Toms River, New Jersey. Len Bundra, IT and GIS director for Toms River Municipal Utilities Authority (TRMUA), built it in 2004. Then, he kept adding layers. He added aerial imagery, parcel data, and information from agencies such as the New Jersey Department of Transportation, the US Department of Agriculture, and the US Census Bureau. Bundra had one belief in mind: "If you build it, they will become aware."

He was right. When Hurricane Sandy hit the East Coast of the United States in October 2012, the map was suddenly the go-to information source for emergency responders, utilities, public works, private surveyors, and local assessors. Bundra quickly updated the map—known officially as the Toms River Municipal Utilities Authority GIS Map. He added poststorm satellite imagery from the National Oceanic and Atmospheric Administration (NOAA) along with current floodplain delineations and Sandy high water mark data from the Federal Emergency Management Agency (FEMA).



↑ NOAA imagery for the Barrier Island areas of Toms River. Above shows before Sandy. Below shows after Sandy.

Anyone who needed to quickly get an accurate picture of the Sandy situation could click the TRMUA GIS Map. Bundra built it, and people did come. Police and fire fighters came to determine where to deploy resources. Electric, gas, and water companies came to decide where to start restoring services. Homeowners, evacuated and eager to survey

the damage to their property, came to look at before-and-after aerial photos. And, as Bundra predicted, people most definitely did become aware.

"The map served as a valuable resource for the police department after Sandy," said Mike Burke, IT and 911 coordinator for the Toms

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## "If You Build It, They Will Become Aware" continued from page 5

River Police Department. "We relied on that visual representation—the before-and-after layers—to set up security perimeters and determine where to place cement barriers."

Since the TRMUA GIS Map was built on the Esri ArcGIS platform and hosted by Amazon Web Services, it provides virtually unlimited power for analysis, collaboration, and spatial data processing. For example, following the storm, many outside contractors arrived on the shores of New Jersey to restore the region's infrastructure. One group in particular was engineers who needed to figure out the best plan for repaving roads. The TRMUA GIS Map helped them find their way around unfamiliar areas. They were able to use the map to locate important elements such as parcels, street addresses, hydrants, and underground utilities.

In the weeks and months following Sandy, the map continued to help. Utilities used it to review parcel polygons on the barrier islands to identify houses and neighborhoods that

were destroyed so those ratepayers would not be charged for the year 2013. The map's links to FEMA flood advisory maps is helping affected townships adopt a new flood insurance risk map. Bundra also recently added a layer to show houses that are slated for demolition and/or labeled uninhabitable to advise citizens and utility companies on where to focus rebuilding infrastructure.

For Bundra's own company, the TRMUA GIS Map continued to serve as a hub. "Simply stated, the Toms River MUA GIS Map is a comprehensive, one-stop shopping database of all useful pieces of information for everyone within TRMUA, as well as contractors, plumbers, consultants, and more," said Nicholas Otten, authority engineer for Toms River Municipal Utilities Authority. "All various pieces of data are centralized and accessible by every TRMUA department within the office or in the field."



Before Bundra created the map, Otten said TRMUA engineers had to sift through a room of drawers with thousands of engineering drawings for information or request data from other departments or agencies. Often, they would have to send out crews for field visits. Now everything they need is on the computer screen with an aerial basemap.

Otten says he can now view maps of all 430 miles of pipe, 9,600 manholes, and 18 pump stations, along with all attributes. At a glance, he can see whether a pipe or manhole has been inspected or rehabilitated and then simply click to view an inspection report or video. He can access various aerial maps, including post-Hurricane Sandy and aerial basemaps from as far back as 1930. He can tell when a service lateral has been cut



↑ There are 2,558 points hyperlinked to post-Sandy aerial oblique photographs from Civil Air Patrol added to the TRMUA GIS Map.

and capped and see the triangulated location sketch of the curb cleanout.

The map shows all billing information, including the recorded number of fixtures within a building. It also shows pump station data and the number of connections flowing to the station, hundreds of pages of data on emergency generators, wiring diagrams, pertinent engineering drawings, and pump curves.

"With a few clicks, I am also able to generate specific reports," Otten said. "With GIS, I can determine the approximate, average flow within any given pipe segment. I can list pipes and manholes by name. I can find the names and mailing addresses of property owners within 200 feet of one of our construction projects."

## History of GIS at TRMUA

TRMUA began its GIS work in 2005 in an effort to assemble 40 years of paper plans and files into a centralized mapping interface. The system was built entirely by in-house staff, without the use of any outside consultants, and was completed within two years.

All 9,600 of TRMUA's sewer manholes had exact coordinates verified in the field using submeter GPS units. More than 600,000 line and manhole attributes were entered into an Esri geodatabase from more than 3,000 engineering plans.

In addition, an entire GIS parcel basemap was created from scratch to include additional elements not typically found on the tax maps.

For example, 3,000 individual condo units and all major apartment buildings were added to the basemap, which was then aligned to New Jersey State US Geological Survey (USGS) orthophotography.

The system is now available for all TRMUA office staff across an internal network and to all field staff via ruggedized laptop units. "The GIS has increased operational efficiencies across all departments by allowing instantaneous access to data that previously had to be searched for amongst reams of paper files and plans," Bundra said. "The GIS also allows our field crews access to all the information they need to quickly assess and properly address emergency situations."



# Mobile App Opens Customer Interaction

## Washington Suburban Sanitary Commission

The Washington Suburban Sanitary Commission (WSSC), headquartered in Laurel, Maryland, recently used Esri technology to develop a mobile application where customers can pay bills, report outages, and check the status of a service request. The mobile solution increased customer satisfaction by providing functionality 24/7 via iPhone, Android, or BlackBerry smartphones.

Customers can use WSSC Mobile to pay all or a portion of their bill, view bill and payment history, purchase watershed use permits, and see a historical graph of actual household water consumption. Customers can also report problems immediately to WSSC staff and check for updates on service alerts in their area.

Established in 1918, WSSC is among the largest water and wastewater utilities in the nation, with a network of nearly 5,600 miles of freshwater pipeline and more than 5,400 miles of sewer pipeline. The company serves 1.8 million residents through approximately 460,000 customer accounts. WSSC drinking water has always met or exceeded federal standards. WSSC operates and maintains three reservoirs, two water filtration plants, and six wastewater treatment plants.

"We needed a more efficient way to interact with customers without tying them to desktop computers," said Mujib Lodhi, chief information officer for WSSC. "We also saw an opportunity to improve service and repair operations using data gathered by customers' mobile devices."

The ability to report an outage—complete with location information and images—is particularly useful to WSSC. It potentially adds 1.8 million pairs of eyes, those of the customer base, to help monitor nearly 11,000 miles of water and wastewater system infrastructure.

Within the customer contact center, Lodhi said they anticipate reductions in call volume and call-handling times, as well as the near elimination of the routine customer requests that can be more easily handled through the mobile application.

Quicker incident reporting will lead to faster repairs, dollars saved, and better service for the community when it comes to water incidents and emergencies.

To build the mobile app, WSSC used its existing industry-standard web and Esri ArcGIS architecture, the IBM WebSphere suite for all Java 2 Enterprise Edition (J2EE) applications, and Oracle for the relational database management system.



← Using the WSSC mobile application, customers can pay bills, report outages, and check the status of a service request.



# Spatial Wave Software Benefits ArcGIS Users

Spatial Wave Software delivers high-quality, innovative, GIS-based software products for those seeking to maximize their investment in ArcGIS from Esri. Spatial Wave Software was formerly the products division of DCSE, a California-based engineering and GIS consulting firm, and has been an Esri partner since 1996. Spatial Wave products are designed based on over 25 years of GIS experience delivering solutions to water and wastewater utilities.

The Spatial Wave product family includes Mapplet, a robust workflow and operations dashboard; Field Mapplet, a mobile workflow solution; and Mapplet Library, a GIS-based map and document management system. Each of these solutions has the ability to work independently of each other.

Field Mapplet is specially designed to manage any workflow that spans office and field, including underground service alerts, work orders, customer service requests, periodic monitoring, and inspections. MP/USA is a configuration of Field Mapplet supporting a utility's one-call process. Field Mapplet easily integrates with an organization's tabular, document, and Esri data environments.

Mapplet enables users across the enterprise to gain access to data and documents from a spatial perspective. Mapplet is integrated with ArcGIS API for Silverlight from Esri. It allows you to gain access to data from all aspects of your organization, including customer service, field operations, engineering, and finance, and any other enterprise data to which you wish to connect.

Mapplet Library is a web-based application for distributed sharing of thematic ArcGIS maps. Mapplet Library has been deployed at numerous water districts to make it easier to find and view large libraries of maps already



↑ GIS Platform and Powerful Organization Viewer



↑ GIS for Spatially Enabled Workflows



↑ Mobile Solutions for Utility Field Crews

created by multiple departments. It reduces the technical proficiency needed and increases the audience within your organization who can benefit from GIS assets. In fact, in the early days of Mapplet Library, thousands of Esri International User Conference (Esri UC) attendees were using the application at the Map Gallery to submit and retrieve entries for the Map Gallery competition.

Spatial Wave is a single vendor with extensive experience providing proven, integrated

solutions and services for water and wastewater utilities. Spatial Wave is known for providing a cost-effective solution suite that is easy to use, proven, efficient, and cost-effective to maintain. Spatial Wave understands the needs of water and wastewater agencies, anticipates the future needs of a district, provides additional solutions, and scales with each client's needs.

Visit [www.spatialwave.com](http://www.spatialwave.com).

# Securing Water Quality through Mobile Mapping

By Barry Kelly, Esri Canada Limited

Residents of Collingwood in southern Ontario, Canada, can rest assured that the water distribution system they depend on is in good hands thanks to a unique mobile application. Developed using ArcGIS, the app supports effective fire hydrant flushing throughout the town—a central component to delivering clean water.

Fire hydrant flushing is one of the most important practices that can be performed on a water distribution system and provides an opportunity to check for leaks, proper valve operation, corrosion and rust, water pressure, and chlorine levels. If ignored, corrosion and rust can cause serious public safety concerns, not to mention threats to water quality.

In the town of Collingwood, fire hydrant maintenance is carried out by Collingwood Public Utilities/COLLUS Power, a municipally owned utility that provides both water and electricity services. With a commitment to continuous improvement through innovative business processes and technology, COLLUS signed an enterprise license agreement (ELA) with Esri Canada Limited so that it could cost-effectively deploy multiple licenses of ArcGIS and integrate the software into the weekly and annual flushing program.

“Our field operations have rapidly evolved,” said Jody Wilson, GIS technician, COLLUS. “We’ve expanded from a few licenses to running ArcGIS in 12 of our trucks. As a result, we’re operating more productively, and our ability to capture accurate data has grown by leaps and bounds.”

Each week, operators flush out what’s known as “dead end” hydrants—hydrants located at the end of a street that receive water from a single direction. These hydrants must be checked on a regular basis to ensure

that they are fully functional and that chlorine levels are in line with government standards.

Flushing the hydrants involves opening one of the three ports of the hydrant and allowing the water to flow wide open. Crews check for ease of opening and closing, ensure that water flow stops when the hydrant is shut down, and check to see if remaining water drains down below ground level into the surrounding soil. If a hydrant does not perform all these functions with ease, the hydrant is flagged for repair.

To record results, operators use GPS-enabled ruggedized mobile units that provide access to basemaps; orthoimagery; and layers of data such as parcels, property boundaries, parks, and streets. When conducting a flush, a new task is opened in ArcGIS, and the operator fills out a series of attributes that are pulled from the utility’s main database. Attributes include the operator’s name, the date of the flush, current chlorine levels, the amount of water flushed, and the hydrant’s pounds per square inch (PSI).

A user-friendly touch screen makes it quick and easy to record the results of the inspection and move on to the next hydrant. Once the operator returns to the office and is within wireless range, all the new data is instantly synced back to the main database.

Then models created using ArcGIS enable data to be automatically calculated. For example, the amount of waste resulting from a flush can be instantly generated and included in reports required for annual audits.

“We’re working more efficiently and are much better equipped to demonstrate compliance,” said Wilson. “Our reports are no longer based on assumptions. Through GIS, we’re able to report on exactly how many

hydrants were flushed, for what length of time, as well as the volume of water flushed to ensure complete accuracy when audited.”

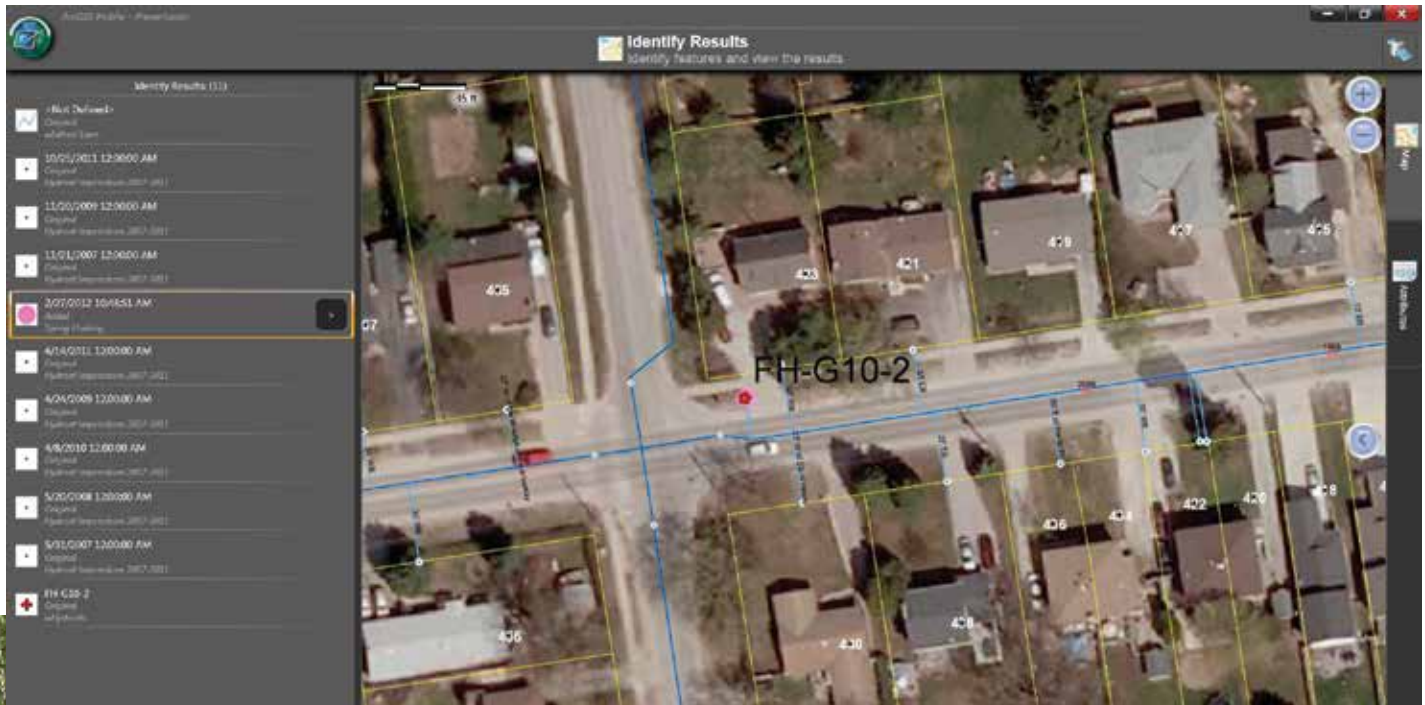
In addition to weekly dead-end flushes, COLLUS is responsible for conducting a biannual inspection of the town’s 1,200 hydrants. GIS is used to keep an up-to-date inventory of the hydrants and analyze each asset’s history. To carry out the biannual flushes, four trucks are dispatched to different areas of the town. Through shared access to the data, all four

**“We’re working more efficiently and are much better equipped to demonstrate compliance. Our reports are no longer based on assumptions. Through GIS, we’re able to ensure complete accuracy when audited.”**

—Jody Wilson, COLLUS







↑ The Identify tool in ArcGIS is used on a recently added hydrant inspection. The Identify Results window shows inspections dating back to 2007, which can be individually selected and viewed by operators in the field.

operators can ensure that no hydrants are missed during the inspection. When an asset is identified as in need of repair, operators mark this on the attribute form, and a call for service is placed immediately.

Previously, operators would record data by creating hand-drawn checklists in Excel spreadsheets. The sheets would then be stapled together, placed in a binder, and used during the annual audit. Using this system, the utility was not able to automatically call up data, perform calculations, or analyze the asset's history.

"We can now pull up a five- to six-year history of a hydrant and proactively troubleshoot any potential issues pertaining to that asset," said Wilson. "For example, if we receive a complaint from a resident regarding a water issue, we're able to instantly view nearby hydrants, check the condition, and see the date of the last flush to get to the root of the problem."

In the near future, COLLUS will look at extending GIS capabilities to Apple and Android devices so that operators in the field will be able to capture data using smartphones or tablets.

Visit [esricanada.com](http://esricanada.com).



# Basic GIS Proves Innovative in a Developing Country

By Rochelle Holm, Washington State University

On a recent rainy day, researchers were huddled in a small laboratory in the Central African country of Malawi, conducting water quality analysis with onlookers eager for GIS maps depicting the results. Few individuals in Malawi are trained in GIS skills, and within the university setting, GIS theory, rather than practical application, is the standard.

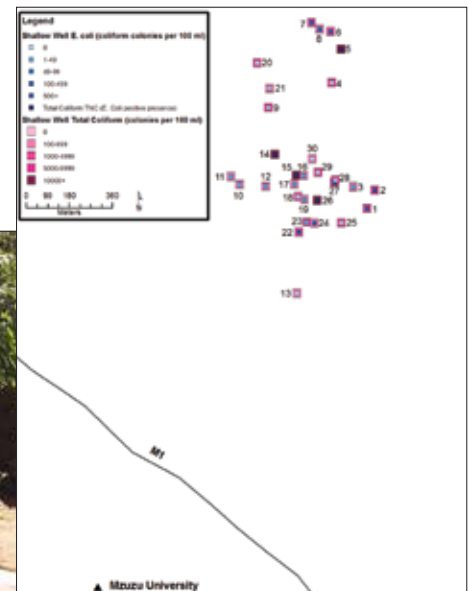
In January 2012, a laboratory for water quality testing was established at the Mzuzu University Centre for Water and Sanitation, Malawi, through a partnership with Washington State University in the United States. In Malawi, university attendance is only 0.6 percent of the population, limiting trained personnel in the water and sanitation sector and those with GIS skills. In many areas of Malawi, the risk to human health from microbial drinking water contamination is not known. This lack of data poses a unique challenge for governmental and nongovernmental agencies working to protect human health and the environment.

Basic skills in Esri's ArcGIS technology were recently used in combination with a water



↑ Shallow well data collection is performed.

quality investigation conducted in Mzuzu in northern Malawi. Although the area has municipal piped water service, shallow wells are still used for drinking by some households. ArcGIS provided a powerful and innovative tool to visually depict the results of this investigation as part of a risk communication



↑ Shallow well water quality results from Mzuzu, Malawi, are plotted using ArcGIS.

## Building Atlanta's GIS continued from cover

to construct a water utility GIS. This phase of the project focused on the consolidation of data spread across 7,000 plat card drawings, hundreds of thousands of inspection records, and 80,000 GPS data points into a spatially accurate, content rich, and widely available GIS.

In addition, DWM employed GIS to support water network hydraulic modeling initiatives, operations and maintenance activities, and capital improvement planning.

The Valve and Hydrant Asset Assessment Program named two key objectives: restore Atlanta's water distribution system of approximately 48,000 valves and 24,000 fire hydrants to maximum operability, and develop a GIS database with necessary water system transmission and distribution asset records and GPS locations to meet water utility asset management and maintenance requirements.

Phase I began in 2009. With a three-month time limit, the team began preparing a base of operations at the Peyton Road DWM Pipe Yard. This included permitting, preparation of the yard, procuring equipment, building service trucks, setting up the computer network, and all internal processes.

Phase II began during the final days of setup at Peyton Road. Field Services included the core scope of the primary objective to assess 48,000 valves and 24,000 hydrants and complete in-scope repairs on valves. During these assessments and repairs, more than 100 pieces of data were collected on each asset, including the GPS location. This data was compiled and analyzed scrupulously to meet the needs of the utility to complete a functioning GIS.

To reach assessment and repair goals, the city first worked on pilot areas, then focused

on places where the hydrant flow was not per the minimum standard.

By January 2012, the information services team was delivering data on a weekly basis. The first delivery of 12,511 assets and each subsequent delivery only contained assets that had gone through the entire assessment cycle. This means that each valve and hydrant in the delivery was exercised, made accessible, repaired if necessary, and had its GPS points logged. Furthermore, each piece of data has gone through QA/QC and GIS processes to ensure accurate information and location for the asset.

Phase III began in April 2012 and included utilizing the information for the valves and hydrants collected under the Valve and Hydrant Asset Assessment Program; the group would create the geometric network



depicting the pipes that connect the valves and hydrants together in a functioning hydraulic network. This data, in conjunction with the DWM plat cards showing pipe connections and relative pipe locations, was used to build a geometric network for modeling the flow of water in the water transmission and distribution system. Phase III was successfully completed in December 2012.

By the end of the project, the team had surpassed its goal by assessing its targeted valves and hydrants on time, updated and vastly improved the water distribution system GIS, and come in under budget.

## Additional Benefits

### Hospital Corridor

The city of Atlanta was in the process of replacing a bridge at Peachtree-Dunwoody Road. Along that bridge is a main that feeds seven hospitals. In the event that the main was disturbed, the team wanted to be proactive and make sure there was a secondary feed. It redirected a crew to locate certain valves that, if necessary, could create a new zone to feed the hospitals. A crew spent 1.5 days locating and making accessible seven valves along the hospital corridor in Sandy Springs. Now, should there be a disruption, the city can immediately execute the rezoning plans.

### North Treatment Plant

The North Treatment Plant located in Johns Creek has a 48-foot transmission main running 12 miles that feeds the city. A valve replacement stopped treatment plant pumping for 24 hours. This provided a perfect time to exercise valves along the main.

To take advantage of the downtime, a crew was sent out to locate and identify all the city's valves along the main. Making a trip prior to shutdown allowed all the valves to be exercised in a short period of time. Searching through woods and along the 400 Toll Road, 12 of 15 valves were located and made accessible. The remaining three could not be found because of poor location data. The team exhausted all standard locating techniques, including the use of ground penetrating radar, in an extensive search to find the last three. Instead, GPS was used to pinpoint the area where the team believed them to be.

### More Advancements

With the support of the executive offices within DWM, the GIS Division has implemented a migration of the GIS datasets to the ArcGIS Local Government Information Model; introduced ArcGIS for Windows Mobile; purchased new data servers and updated major application components; built a new web mapping application called the Atlanta Land Information System (ATLIS); integrated GIS and electronic documents and files with the DWM Electronic Content Management System (ECMS); and is looking to ArcGIS Online and its local government integration capabilities by moving toward smartphones and tablets for increased integration of field reporting, viewing, and communication. It has been an ambitious road, and the benefits can be seen by the wealth of information now available to the department.

## Esri Online

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### Access for Water Utilities

This website is for the ArcGIS water, wastewater, and storm water utility community. It provides useful templates and best practice information enabling you to implement ArcGIS to manage your water utility information, perform your daily operations, and support your long-term planning.

Visit [resources.arcgis.com/content/water-utilities](http://resources.arcgis.com/content/water-utilities).

## On the Road

### Mark Your Calendar

#### Esri International User Conference

July 8–12, 2013

San Diego, CA USA

[www.esri.com/events/user-conference](http://www.esri.com/events/user-conference)

#### National Rural Water Association H2O XPO

October 1–3, 2013

Louisville, KY USA

[www.h2o-xpo.org](http://www.h2o-xpo.org)

#### Water Environment Federation Technical Exhibition and Conference (WEFTEC)

October 5–9, 2013

Chicago, IL USA

[www.weftec.org](http://www.weftec.org)

#### Pollutec Horizons

December 3–6, 2013

Paris, France

[www.pollutec.com/GB.htm](http://www.pollutec.com/GB.htm)

# What Does the Esri UC Offer You?

This year, the Esri International User Conference (Esri UC) promises inspiration, collaboration, and practical application for water, wastewater, and stormwater professionals. This conference will provide an opportunity to be surrounded by thousands of fellow GIS professionals who have found innovative solutions to common challenges.

Plan to attend the following moderated paper presentations and technical workshops designed specifically for water, wastewater, and stormwater professionals:

- ArcGIS Online for Water, Wastewater, and Stormwater
- Enterprise GIS
- Getting the Most Out of Your Assets
- GIS Tools for Stormwater Billing
- GIS Implementation

- GIS for Stormwater Management
- Web Technologies for Water
- Water Modeling and GIS
- Innovations in Water GIS
- GIS and Asset Management
- Using GIS for Field Operations
- GIS for Wastewater
- SCADA and GIS

Check out the **Team Water/Wastewater/Stormwater Meeting** scheduled for Saturday, July 6. And, be sure to attend the **Special Interest Group Meeting** at noon on Wednesday, July 10. Plus, the annual Pool Party will be held at the Hilton San Diego Bayfront at 7:00 p.m., Wednesday, July 10.

During the Esri UC, you'll be able to visit the Solutions Island in the GIS Solutions EXPO to speak with Esri experts about ArcGIS for water utilities.

Participate in the **Water Utility Data Health Checks** each day of the Esri UC. Schedule a 45-minute review and analysis of your data from Esri's water utility experts. In addition to examining data accuracy, they will use ArcGIS Data Reviewer for Desktop to run diagnostics and evaluate overall data quality. If you maintain parcel data, they will also be able to assess whether or not it is ready to be loaded into the parcel fabric. To schedule an appointment, e-mail [datareviewer@esri.com](mailto:datareviewer@esri.com) with your name, organization, contact information, and preferred date and time.

For more Esri UC info, visit [esri.com/uc](http://esri.com/uc).



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