



CUSTOMER CASE STUDY

AVEVA™ PI System™ protects critical wastewater infrastructure during extreme weather

HRSD - www.hrsd.com
Industry - Water

Goals

- Integrate data from multiple systems at multiple sites on one dashboard.
- Alert and deploy staff quickly and safely to pump site and data center emergencies.

Challenges

- Staff must triage which pump sites to fix first after tropical storms.
- Staff must be alert to emergencies outside of business hours.

Results

- Real-time monitors track groundwater, tidal and pressure levels at each pump site so staff can easily see which need the most attention at any time.
- Automated cell phone notifications have averted catastrophe by alerting data scientists of emergencies after hours.

Solutions

- AVEVA PI System
- AVEVA™ PI Vision™
- AVEVA™ PI DataLink™

In October 2016, Tropical Storm Matthew brought more than 14 inches of rain to Hampton Roads, Virginia, a region of seven cities at the edge of where the Chesapeake Bay meets the Atlantic Ocean. The region lies below sea level, so it doesn't take much additional water to wreak havoc on a wastewater system and disrupt residents' lives.

Hampton Roads Sanitation District (HRSD) uses AVEVA PI System to integrate data from multiple systems to create dashboards that allow staff members to monitor pump stations and other critical infrastructure in real time. AVEVA PI System enables staff to triage problems as they arise, rather than losing critical time waiting for information. AVEVA PI System is now also helping HRSD to monitor its data centers. The company uses the event frames and notification capabilities in AVEVA™ PI Server to receive important alerts when temperatures in the data center cross certain thresholds.

The “perfect storm” for wastewater system disruption

When stormwater infiltrates a wastewater system, it increases pressure on the system, and overflows quickly become public health and safety hazards. Tropical Storm Matthew brought prolonged periods of rain to Hampton Roads at a time when groundwater levels were already high from heavy rain the previous month. “This set the stage for some disastrous flooding,” said Lyne Swimpson, a data analyst at HRSD. Vehicles were flooded out, and people were trapped in their homes for days.”

Because Hampton Roads is located below sea level, rising tide levels can also increase pressure on the wastewater system – creating the potential for a double threat when a tropical storm brings both elevated tides and increased rainfall. “We can get flow coming in from cracked pipes and leaky manholes, and that adds additional wastewater for us to treat and pump,” Swimpson said. HRSD monitored both groundwater and tide levels throughout the storm and used AVEVA PI System to track pressure levels at wastewater pump stations throughout the region.

Using data to create a plan of attack

By the time the storm ended, many of HRSD's pump stations were at the highest alert levels. Using AVEVA PI Vision, the team could easily see which stations required immediate attention and dispatch staff accordingly.

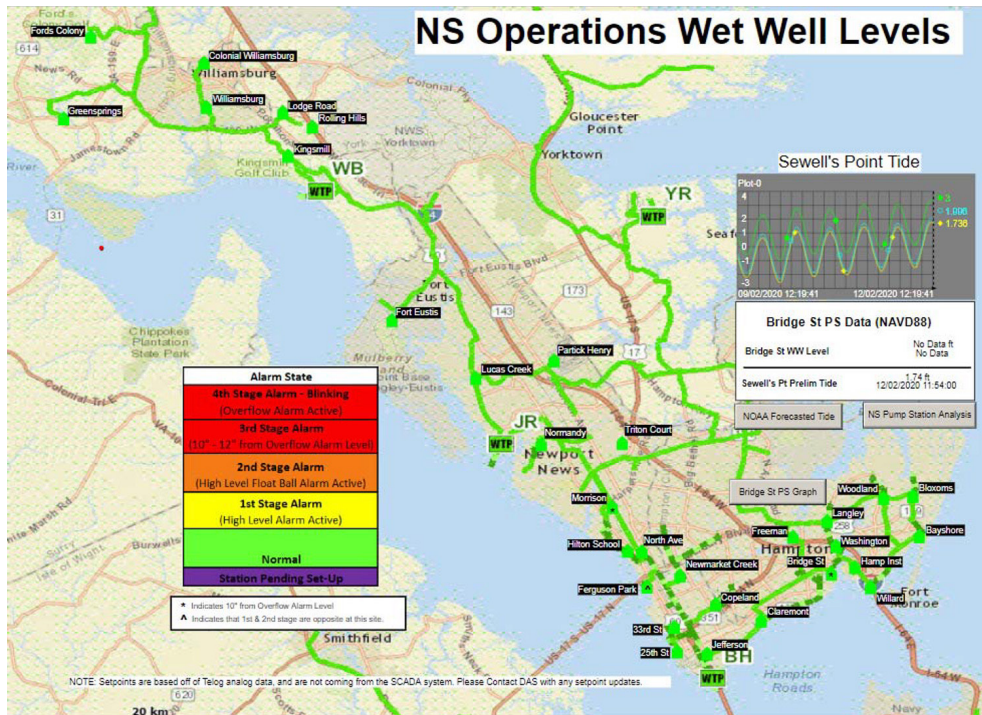
Additionally, notifications in AVEVA PI Server alerted team leaders to hazardous conditions at pump sites so they could quickly communicate with on-site crews about changes to response plans.

HRSD's AVEVA PI Vision dashboards respond dynamically. When a user selects a new site, the dashboard displays both geographic information system (GIS) and historical data about it. These tools give staff the data they need to assess each station's risk fully and target problematic stations first. “A user can quickly click on a station and get a more in-depth look at what's going on and whether the pumps are operating correctly,” Swimpson said.

Having this data available in a real-time dynamic dashboard transformed HRSD's operations during a critical time. “Prior to PI System, we would send out PDFs at the beginning of every hurricane season. Now, our staff can save the PI System as a favorite in their browser and turn to it any time they need information. The ease of access and better visualization has increased efficiencies and productivity and added real value to our end users.”

“Our PI Vision and PI operations dashboards have been game-changers during major weather events. They allowed us to make the best decisions and mitigate damage to our infrastructure and to public health.”

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Lyne Swimpson
Data Analyst at HRSD



AVEVA PI Vision dashboards help users monitor wastewater levels at pump stations and use intuitive colors to alert staff when they need to take action.

A proactive approach to managing data centers

In addition to infrastructure management, HRSD also uses AVEVA PI System to monitor its data centers throughout the region. HRSD did not have formal data center monitoring until 2015 and only knew about issues when equipment failed. "The data center is typically taken for granted until there's a failure. You have to spend a lot of resources on recovery, when in many cases, the failure could have been avoided," said Robert Davis, HRSD'S IT liaison and AVEVA PI System coordinator.

Now the company uses AVEVA PI Vision displays and AVEVA PI DataLink reports, as well as the asset framework, event frames and notifications capabilities in AVEVA PI Server to increase monitoring capacity and alert staff when the temperature in any of the centers goes above 75 degrees.

In 2019, AVEVA PI System helped HRSD narrowly escape a potential catastrophe. After business hours on September 4, 2019, when temperatures in the data center remained above 75 degrees Fahrenheit for 15 minutes, Tiffany Elston, a data scientist at HRSD, received a notification from AVEVA PI Server on her phone. While out to dinner with family, Elston was able to access an AVEVA PI Vision screen by clicking on the notification. The temperature in the data center then surpassed 80 degrees. In less than two hours after the first notification from AVEVA PI Server, IT and maintenance staff arrived at the data center and fixed the problem. Without the notifications triggered by AVEVA PI System, the data center may have crashed just two days before Hurricane Dorian was set to strike the area.

For more information about maximizing operating efficiency in water and wastewater facilities, visit: aveva.com/en/industries/infrastructure/water-wastewater.