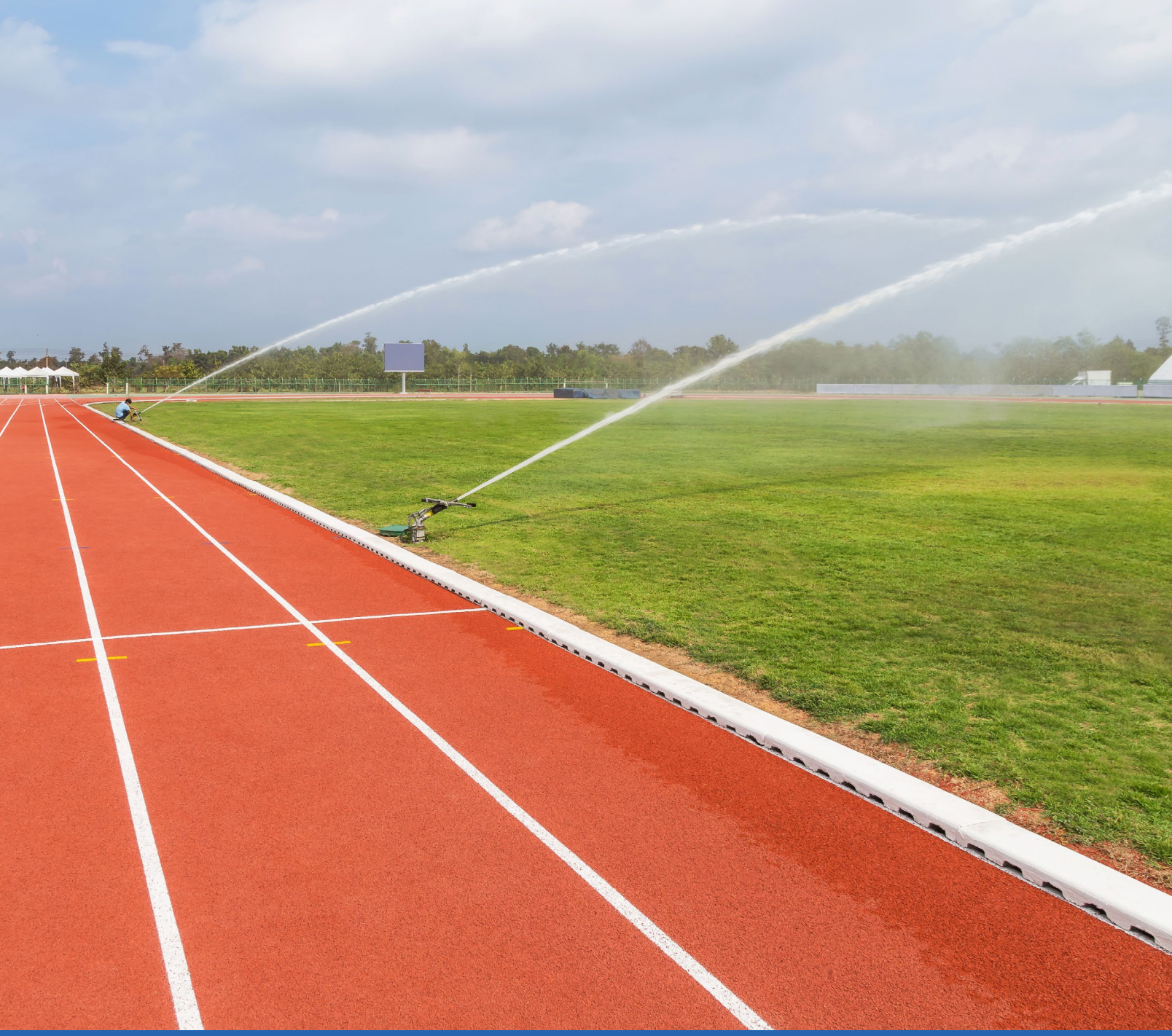

By Meg Mason

Leveraging IoT for Smart Water Management

Just in the United States, outdoor water use averages more than nine billion gallons of water each day, mainly for landscape irrigation. As much as fifty percent of this water is wasted as a result of overwatering and inefficiencies in traditional irrigation methods and systems. Smart irrigation technology is the answer.

Smart Irrigation: Tailoring Watering Schedules

Smart irrigation systems tailor both times and watering schedules in order to automatically meet specific landscape needs; the controllers drastically improve efficiencies in outdoor water use.

Unlike the traditional irrigation controllers, operating from timers and a preset programmed schedule, smart irrigation controllers are able to monitor soil conditions, weather, plant use, and evaporation to automatically adjust the watering schedule to real-time conditions of the site.

For example, as outdoor temperatures increase or rainfall decreases, smart irrigation controllers consider on-site specific variables, such as soil type or sprinklers' application rate, to adjust the watering run times or schedules.

Weather-Based or Soil Moisture Sensor Controllers

Essentially there are two types of smart irrigation controllers: weather-based (ET) and on-site soil moisture sensors. The right solution depends on your geographic location and landscape environment.

Weather-based controllers, also referred to as evapotranspiration (ET) controllers, use local weather data to adjust irrigation schedules. Evapotranspiration is the combination of evaporation from the soil surface and transpiration by plant materials. These controllers gather local weather information and make irrigation run-time adjustments, so the landscape receives the appropriate amount of water.

ET weather data uses four weather parameters: temperature, wind, solar radiation, and humidity. It's the most accurate way to calculate landscape water needs. There are three basic forms of these weather-based ET controllers:

• Signal-based controllers use meteorological data from a publicly available source and the ET value is calculated for a grass surface at the site. The ET data is then sent to the controller by a wireless connection.

• Historic ET controllers use a pre-programmed water use curve, based on historic water use in different regions. The curve can be adjusted for temperature and solar radiation.

• On-site weather measurement controllers use weather data collected on-site to calculate continuous ET measurements and water accordingly.

Soil Moisture Sensor-Based Controllers

Soil moisture sensor-based smart irrigation controllers use one of several well-established technologies to measure soil moisture content. When buried in the root zone of turf, trees or shrubs, the sensors accurately determine the moisture level in the soil and transmit this reading to the controller.

There are two different soil moisture sensor-based systems available:

• Suspended cycle irrigation systems, which are set like traditional timer controllers, with watering schedules, start times and duration. The difference is that the system will stop the next scheduled irrigation when there is enough moisture in the soil.

• Water on demand irrigation requires no programming of irrigation duration (only start times and days of the week to water). It has a user-set lower and upper threshold, which initiates irrigation when the soil moisture level fails to meet those levels.

Smart Irrigation Saves Times and Money

The experts agree that smart irrigation systems and controllers versus traditional irrigation controllers conserve water across a variety of scenarios. Several controlled research studies indicate substantial water savings anywhere from 40% to as high as 70%.

Tests by the Irrigation Association (IA) and the International Center for Water Technology at California State University in Fresno have shown smart irrigation controllers to save up to 20% more water than traditional irrigation controllers.

Another study tested a prototype controller/receiver system consisting of a traditional irrigation controller modified to receive a signal broadcasted via satellite. Outdoor water savings were calculated based on 2-years of pre-installation usage and were adjusted for weather conditions. The reported average outdoor savings is 16%, and it is also reported that this finding represents 85% of potential savings based on reference ET.

Data-Enabled Water Management Makes Life Greener for Facility Managers

From cooling towers to sewer systems and landscape irrigation, water is one of the four key elements of nature that facilities professionals must manage to ensure the most efficient use of this precious resource.

Unfortunately, most water systems are not top of mind—until something goes wrong. Even then, the event is likely to go unnoticed without notifications or physical intervention. Unless your water management is connected via the Internet of Things (IoT), there's no way to know when something goes wrong.

Outdoor water management is a perfect example. Many facilities operate irrigation systems with irrigation controllers that are nothing more than glorified timers. These are rarely adjusted, so the typical facility is over-watering every day. Damages from overwatering can include hardscape damage, slope and foundation damage, increased risk of mold, plant loss, penalties and fines, brand damage, and increased slips and falls. Thankfully, those days are over. Now data-enabled, smart water management, connected via IoT makes it possible to locate leaks, pipe breaks and mitigate irrigation overwatering in real time, before damage is done.

Data-Enabled Water Management for Water Optimization

Many facility managers using IoT and big data are proving that these powerful tools make it possible to save a significant amount of water and money through smart water management.

Why are leading facility managers now so focused on data-enabled water management? Since 2010 water rates in the U.S. alone have risen more than 41 percent on average, and large water users are seeing substantial increases in their water costs forcing organizations to make difficult choices and prioritize water usage.

Leveraging IoT to Create Energy-Managed Water Systems

IoT provides the ability to cost-effectively establish real-time wireless communication, control and sensing in the field, while leveraging the cloud and big data to do the heavy lifting.

With smart irrigation systems, water delivery is weather-based. The system transmits site conditions to the cloud, enabling cloud-hosted big data systems to identify new problems before they become huge expenses. With flow sensors on cooling towers, changes in water makeup percentages result in a host of operational inefficiency alerts.

For example, as the implementation of water restrictions and regulations continues, smart water management data helps keep track of water agency compliance regulations. Without them, you and your other facility managers could spend hours verifying that your buildings are compliant, only to find that regulations have changed.

Smart water management solutions also enable you to verify compliance in a single report and automatically receive updated information on a regular basis. Before these IoT, big data and cloud solutions were available, it was impossible for managers to have

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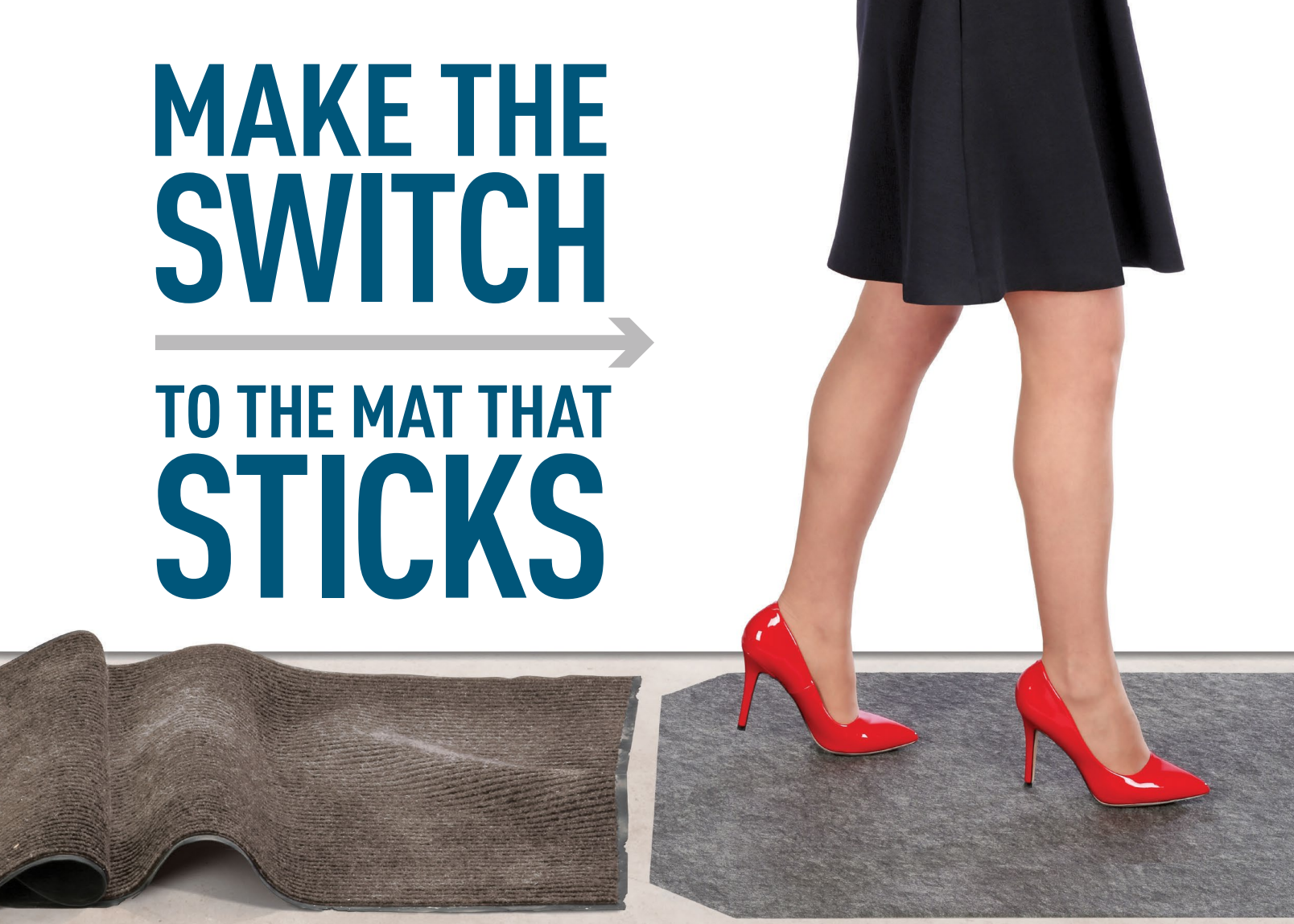

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continuous visibility into a facility's water use and waste. With affordable real-time flow sensor and wireless technology, facility managers and landscape contractors can be instantly alerted to any leak issue, whether it happens indoors or outdoors. Massive amounts of information and use analytics transform the data into succinct actionable knowledge.

Saving Billions by Deploying IoT-Driven Smart Water Management

Smart water management platforms today are saving leading companies billions of gallons of water, millions of dollars and thousands of staff hours annually. They accomplish this by using field-proven water sensors and water control systems with affordable wireless communications (IoT).

Like energy management systems, these systems can be customized to meet an organization's unique needs. By documenting building water use across portfolios, you can identify use anomalies and potential liabilities. Facility managers can also manage water use through real-time dashboards that allow proactive budget monitoring.

Choosing a Smart Water Management Solution

When selecting a data-enabled smart water management solution, there are three critical areas to consider, which are listed below.

Solution track record: If you're looking for a smart water management system, ensure it is certified (such as by WaterSense, a partnership program by the U.S. Environmental Protection Agency) and check recent references of customers with sites like yours. Also, ask if any independent studies have been performed on the technology. If so, how many and by whom?

Total cost of ownership: Your goal as facility manager is to ensure you get the biggest bang for your buck. Don't be lured into systems that just tout low costs. Many of these "low-cost" solutions fail to deliver more than average savings and the technology requires either frequent recalibration or replacement to remain accurate. Instead, evaluate data-enabled water management systems based on the total cost of ownership. Look at the technology choices made by large retailers, as they tend to look at the long view and are extremely cost conscious.

Extensibility of the solution: A key consideration when selecting a smart water management solution is whether it is based on a platform that allows users to efficiently and economically upgrade, add complimentary products, and address new pain points as they arise. The bottom line is that IoT and big data will continue to be a focal point in water management discussions. Why? Because these solutions offer true value and solve important facility issues. The key is to make sure your decision makes economic and operational sense by choosing a system that delivers what really matters—actionable knowledge that saves time, money and, ideally, one of the planet's most precious resources.

ABOUT THE AUTHOR: Meg Mason is Senior Director of Marketing at HydroPoint, the makers of WeatherTRAK and Baseline smart irrigation systems. In addition to irrigation solutions, HydroPoint is the proven leader in smart water management solutions, making water – both indoors and out – simpler to manage through visibility and automation. To learn more, visit www.hydropoint.com.

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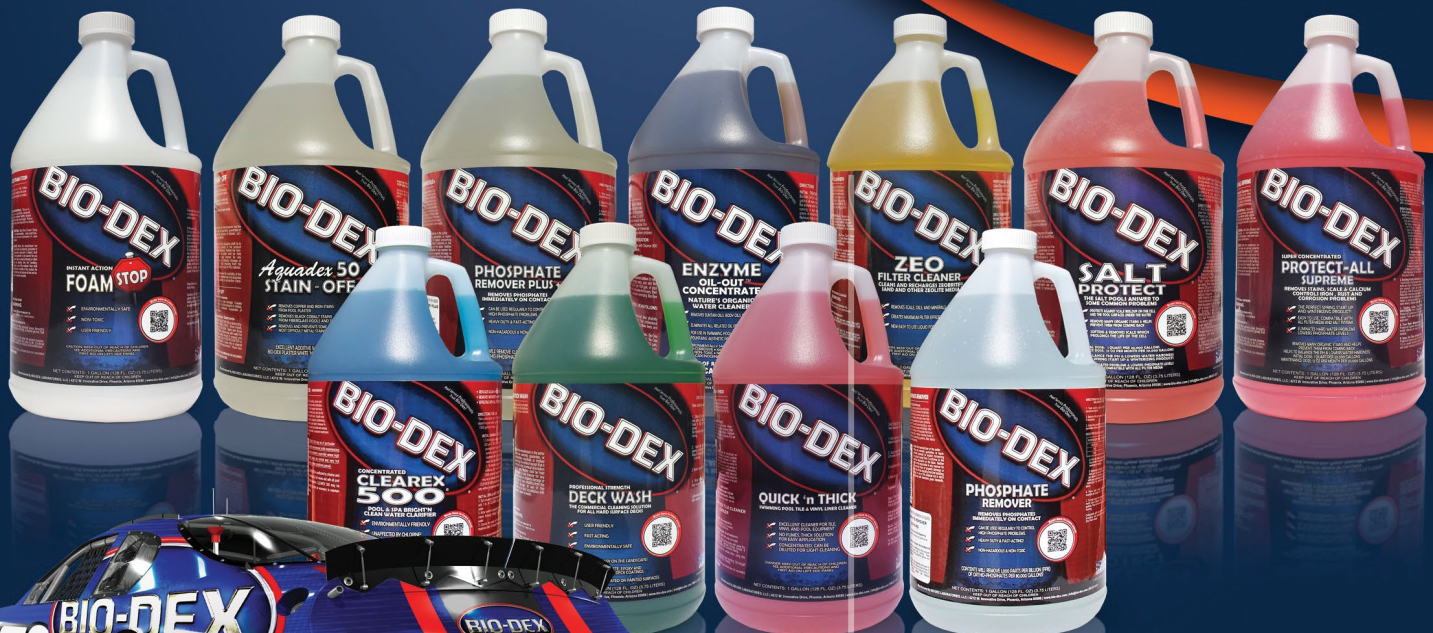

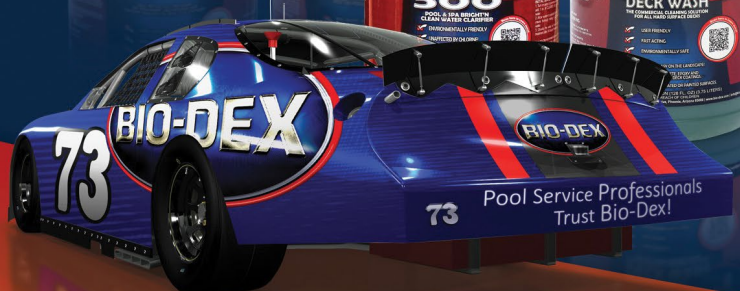

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