E-BOOK: SUCCESSFUL US WATER MANAGEMENT STRATEGIES 2020
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INTRODUCTION

Water management for businesses, local governments, schools, and organizations of all sizes has shifted across the United States in recent years like a towering wave heading ashore. For a long time water was ridiculously underpriced so there was little motivation to take a closer look and make improvements. Leaks went unnoticed inside buildings and outdoors on properties. Plants and trees got over-watered, becoming vulnerable to being uprooted by storms. Sprinklers strafed fence lines and ran in the rain.

Now, water management is finally coming out of the shadows. Climbing water costs and new tiered rates are motivating sustainability leaders to find out what they’re really doing with this resource. Sensors and wireless technologies allow control over water that was previously unfathomable — and much faster response time to address leaks and other problems. State regulations have also begun steering water users toward conservation.

The perception of water in the United States used to be that it was one of the most freely available resources, observes Chris Spain, president and CEO of HydroPoint Data Systems, which provides smart water management products and services to more than 30,000 customers nationwide. He frequently encountered what he calls “water blindness,” where executives simply couldn’t understand the scope of damages and risk associated with poor water management.

“You should be looking at water more, particularly on your site, because it’s an area of profound waste,” he would tell prospective customers. “It’s the gift that keeps taking.”

Then, about five years ago, Spain noticed a change. Droughts affected parts of the country. Climate change became a greater focus for organizations. The Internet of Things (IoT) expanded, delivering more timely data. Many water users still didn’t know the extent of their problems, Spain says, but they had begun to care.

Whether you’re a novice or an experienced pro, here’s what you need to know about adopting smarter water management strategies in the United States.

“

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—Chris Spain, HydroPoint
WATER PRICES ARE RISING

The pressure is mounting to better manage water usage. A lot of that comes from rising water prices in the US. Bluefield Research’s US Municipal Water and Wastewater Utility Bill Index published in July 2019 found that bills had gone up by 3.6% over the past year. Utility and wastewater bills have risen consistently since 2012 in 50 cities, according to the index.

The team at the Colorado-based irrigation management company ET Irrigation, owner Brian Bair and director of business development Bob Olson, have noticed rising water prices. “The price keeps going up and the supply does not so there’s pressure on a finite supply,” Olson said. He added that people they talk to from the public and private sectors are becoming less tolerant of the costs associated with water waste.

One of the major cost drivers in the water industry is aging infrastructure, Spain says. In 2012, the American Water Works Association (AWWA), a nonprofit representing water supply professionals, reported that repairing and replacing the drinking water infrastructure alone in the US would cost $1 trillion over 25 years. For the AWWA’s 2019 State of the Water Industry report, members ranked “renewal and replacement of aging water and wastewater infrastructure” the sector’s number one issue.

Water scarcity due to depleted aquifers is another factor affecting water prices in the country. So is the increased cost of treating water. “Google ‘water crisis’ and you’ll see an endless list,” Spain said.

MISMANAGING WATER CREATES MAJOR RISKS

The consequences of water mismanagement can be severe. One is more liability risk. As Spain explains, over-irrigating an outdoor area such as a parking lot or sidewalk can increase moss or algae growth, making it slippery. Some parts of the country are more litigious than others, he pointed out. Slip and fall liability exposure is a pretty significant risk for property owners to face, Spain said.

Safety is also a concern, says Lott Steffey, a co-owner of Mosaic Consulting in Orange County, California. The horticulture consulting and landscape management services company works with Ladera Ranch, a master-planned community in Southern California that has a population of nearly 23,000. Thousands of kids play soccer and other sports there, Steffey said, and if the irrigation for sports fields isn’t properly maintained, playing could become unsafe.

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THESE STATES HAVE THE MOST EFFICIENT WATER LAWS

The Alliance for Water Efficiency and the nonprofit Environmental Law Institute evaluate each state’s laws supporting water conservation and efficiency.

Their most recent five-year scorecard, published in December 2017, surveyed all 50 states on efficiency and conservation as well as climate resiliency.

Only 11 states received an A or B in both surveys: California, Colorado, Connecticut, Massachusetts, Minnesota, New Hampshire, North Carolina, Oregon, Rhode Island, Washington and Wisconsin.

“The sustainable management of our fresh water resources is fundamental to the stability and long-term growth of our communities and economies,” the report said. “In failing to pursue every avenue of water conservation and efficiency, many communities will face greater supply challenges in the future.”

Poor water management can also affect your brand’s reputation. For example, if you are located in a community experiencing water rationing for yards and overwatering is causing a flow from your parking lot down the street, your corporate leadership gets called into question. “That can be detrimental to companies that want to continue expanding their businesses and get community support for bringing in a new store,” Spain noted.

Over-watering landscaping also sets the stage for environmental destruction. Besides producing runoff that flows into local bodies of water, saturated plants and trees don’t grow deep roots. When a storm comes, they’re likely to topple over.

Steffey says that a single tree in Ladera Ranch can easily be valued at $10,000 to $15,000. However, putting a dollar amount on trees can be difficult because they also have aesthetic and environmental value that’s hard to quantify. “Once a tree gets planted and rooted in the community, it’s almost irreplaceable,” Steffey said.

Indoor water mismanagement can be extremely costly as well. Spain recounted one of the Los Angeles Police Department’s car washes that had a bypass valve locked in the “on” position. The issue sent 600 gallons down the drain hourly and went unnoticed for years. The city later estimated that they could have saved more than $100,000 annually if the problem had been caught sooner.

“A single tree in Ladera Ranch can easily be valued at $10,000 to $15,000.”

—Lott Steffey, Mosaic Consulting
Unexpected damage from water messes with budgets. Olson said that ET Irrigation has seen how bad water management practices affect hardscape surfaces, causing accelerated deterioration. Bair pointed out that this kind of unchecked erosion may mean dipping into reserve accounts early to pay for replacements.

NEW STATE REGULATIONS

Most states have prescriptive strategies around water, like Connecticut’s law requiring rain sensors on irrigation systems. But some states are starting to set targets for how much can be used, says Mary Ann Dickinson, president and CEO of the Alliance for Water Efficiency (AWE), a nonprofit focused on the efficient and sustainable use of water with a membership of nearly 500 organizations.

Massachusetts set a limit of 65 gallons per person per day for both indoor and outdoor water use, Dickinson said. “While that sounds like it’s probably high enough, utilities have to get all of their large water users to ratchet down their water use in order to make that per-capita figure,” she explained. Not meeting the target will mean getting fined.

The latest state to implement water targets is California, Dickinson continued. “They’re setting customized targets for different communities and water systems,” she said. “There will be specific guidance given for commercial and industrial outdoor water usage.”

ADOPT A SMARTER STRATEGY

While state regulations ramp up, Dickinson suggests that organizational leaders in charge of water management develop programs that

WATERSENSE OFFERS FREE TOOLS FOR FACILITY MANAGERS

The EPA’s voluntary partnership program WaterSense and its stakeholders have developed a number of tools to help commercial and institutional facility managers better understand their water usage and identify best management practices to use water more efficiently. They include:

WaterSense Simple Water Assessment Checklist: A straightforward checklist for quickly identifying and targeting which potential projects can save water, energy, and utility costs at your facility.

Water Assessment Worksheets: These worksheets help commercial and institutional facility managers gather important information about water consumption, water meters, existing plumbing equipment, and other factors.

Sample Water Audit Forms: The Environmental Defense Fund and Global Environmental Management Initiative created these sample water audit template forms to help managers conduct water assessments and define the unique water profile of a facility.
measure water savings in a sophisticated and replicable way.

“My biggest advice is audit your facility,” she said, urging managers to find competent professionals. “Get a real water auditor to come in, audit the facility, and track where your water is actually going.”

Audits can pinpoint hidden problems like ice machines that waste water down a drain rather than recapturing it. Other common culprits tend to be toilets and refrigeration systems, Spain says. After eight or nine years, the flexible tubing in a refrigerated system starts to crack, break, and leak. Investigating water usage can illuminate entrenched issues outside as well. Spain described discovering a huge irrigation leak on one customer’s property. The leak had continued for so many years that the neighboring property owner thought it was a natural spring. This accidental man-made water feature cost the customer thousands of dollars annually, Spain said.

Once you audit your facility, you can then develop a plan for improving your water sustainability going forward, Dickinson says. “Getting a road map like that will help you identify what are the strategies that are most cost-effective.”

SECURE YOUR WATER MANAGEMENT IOT SYSTEM

HydroPoint’s Chris Spain says that the Internet of Things (IoT) is robust and exciting, but can carry security risks. He suggests asking the following questions of companies that provide IoT systems for water management:

- Could you describe the wireless network and communications protocol between the IoT devices in the field and your server?
- What kind of encryption are you using?
- What are your corporate policies around data?
- How are you using customers’ data — do you share with third parties?
- What are the customer’s data usage rights?
- In case of natural disaster, what fail systems do you have in place?

“I don’t think there’s one of our customers who’s not worried about security,” says Spain. “It’s not like you’ll lose credit card information, but you still want to make sure that nobody hijacks your system, causes profound waste, or confuses control to your detriment.”
She urges executives to communicate with their water utilities and find out whether an incentive program will pay for part of a proposed improvement. “Especially if you’re in the Western part of the United States, many water utilities have very good commercial and industrial rebate and incentive programs,” she said. “They will even pay sometimes for a free commercial audit if you commit to doing the improvements.”

**INTELLIGENT WATER MANAGEMENT ADVANTAGES**

One of the biggest benefits to implementing smarter water management strategies is saving money. Everything starts with numbers and data, says Steve Linnenberger, owner of Western Water Management and an irrigation designer who works closely with the ET Irrigation team.

“We look at historical maintenance costs for the project, see what the trends and the actual costs are, and then what the water savings potential is for multiple years,” he said. “Then we can look at specific areas of a site and pull out return on investment numbers, and water and maintenance savings compared to what the improvement costs would be for the in-ground upgrades.”

**IRRIGATION MANAGEMENT CUTS OFFICE BUILDING’S WATER USAGE IN HALF**

The Pointe at Park Center is a professional office building located in Westminster, Colorado, on a property that includes about two acres of mixed landscape. ET Irrigation’s Bob Olson describes it as mostly turf with shrub beds surrounding the building.

Concerns about excess water consumption prompted the managers to reach out to ET Irrigation for help. “We compiled the water use history from 2013 to 2016 and validated that water usage was approaching two times what it should be for a property of this size,” Olson said.

Using best management practices, the Pointe at Park Center was able to eliminate that excess water use and increase water use efficiency while maintaining a healthy, visually appealing landscape.

These water management measures included twice-monthly detailed visual inspections, work order generation and immediate correction of water-wasting conditions, ongoing water consumption monitoring relative to a seasonal water budget, and regular communication with the landscape services provider.

During the first year of irrigation management, the Pointe at Park Center cut landscape water usage in half and avoided more than $9,000 in water expenses.
Dickinson said that water efficiency improvements often have a payback period of two years or less. A number of these projects pay for themselves within six months, she added.

Deploying technology like IoT sensors that don’t require manual adjustment and real-time monitoring systems save time as well. Paul Butapetch is the senior director of sustainability for Unibail Rodamco Westfield’s US national operations. The company owns, operates, and develops retail destinations, offices, and convention centers worldwide. They have 32 shopping centers in the US.

“Our operations provide more than half a billion gallons of water annually for tenants’ use,” Butapetch said. “By looking at water usage in real time layered in with what we know about our operating schedules, we were able to identify simple low-cost and no-cost solutions to many issues.” For example, a valve that’s stuck open could be fixed within hours, rather than days or months.

Smart irrigation software and technology increases labor efficiency, Steffey said. René Orta, Mosaic Consulting’s onsite irrigation manager at Ladera Ranch, says they have no-flow alarms for valves. By tracking alarm patterns, the team can catch valves that are starting to go bad but haven’t completely failed yet.

“What with systems that allow you to manage water, program it, and step back, and drive around the community, you can really see what the effects are and try to be proactive,” Orta said. And, since they can program irrigation by parameters like plant type, the system calculates what’s needed to be healthy for the plants — and in line with what the local water district allows.

LOWE’S SAVES $5 MILLION ON ANNUAL WATER COSTS

Starting in 2008, Lowe’s began piloting HydroPoint’s smart irrigation controllers to optimize irrigation outside the home improvement company’s retail stores. Each controller uses AT&T Internet of Things technology.

By the end of 2010, Lowe’s expanded the pilot to a few hundred stores. After realizing significant savings, the company expanded the program to all of its 939 retail facilities.

The smart irrigation system made a difference for Lowe’s bottom line, and for the environment. Annual water bills went down by an estimated $5 million, and the associated annual water savings rose to about 650 million gallons.

Besides saving money and water, Lowe’s also realized annual downstream greenhouse gas savings of about 750 metric tons carbon dioxide equivalent, which the company says is comparable to avoiding the use of more than 84,000 gallons of gasoline.

“This is an example of a project that provides multiple layers of benefits,” Colleen Penhall, Lowe’s vice president of corporate social responsibility, said at the time. By expanding its use of smart irrigation controllers, the company saves money while reducing water usage and lowering greenhouse gas emissions in the community.
Water and energy are so closely intertwined that water efficiencies tend to produce energy savings as well. “Large business will see a reduction in their energy use as a direct benefit of the reduction in their water use,” Dickinson said.

Environmental sustainability is another benefit. Water efficiency is perfect for sustainability leaders who are thinking about corporate social responsibility reporting, says Dickinson.

Careful water resource management bodes well for organizations and businesses that are expanding. Water savings now translate into a reduced need to add capacity later, especially for industrial operations. The local water utility also avoids having to build another treatment plant or create a new reservoir.

**WATER MANAGEMENT SURGES AHEAD**

Better water management is finally coming to the surface in the United States. Although water efficiency projects still often trail energy-saving ones for internal funding and advocacy, the water–energy nexus is too strong to ignore.

The advantages to intelligent water management are clear. Mainly it helps save time, money, and the environment. At the same time, businesses and organizations that don’t manage water effectively open themselves up to greater risks. Slippery surfaces invite lawsuits, runoff harms reputations, improper irrigation threatens valuable assets, while leaks both inside and out drain budgets.

Leaders can no longer afford to waste this resource, and those who don’t start adopting smarter tools, technologies, and strategies will likely get left in the dust.

“By looking at usage in real time, we were able to identify many simple low-cost and no-cost solutions for issues.”

—Paul Butapetch, Unibail Rodamco Westfield
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