



Being Blind to Water Use

is costing your business*
more than you think

**Why Smart Organizations are
Embracing Onsite Water Management**

* and our planet

by Chris Spain, Co-founder, CEO & President, HydroPoint



“By 2030 there will be a 40% gap in freshwater availability.”

Welcome to a New Water Era

What is your onsite water use strategy?

For a long time onsite water management was not a top priority for property owners and property managers. In fact, very few businesses, municipalities, or site owners had any water management strategy at all. From commercial to municipal to federal sites, onsite water management strategy was whether to file water bills in a folder or a trash can.

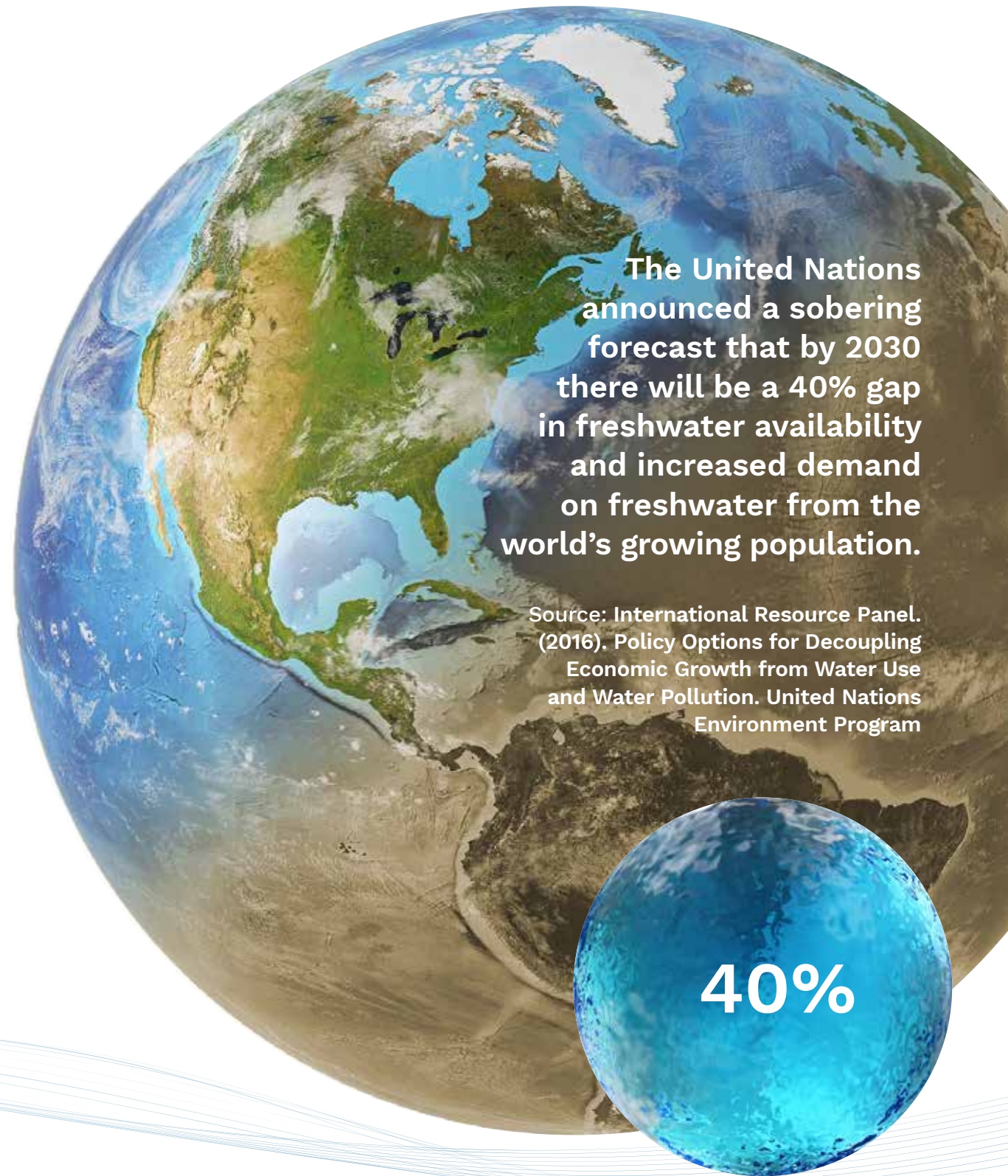
But even back then, in areas facing a shrinking water supply a quiet revolution in onsite water management was starting to find momentum. In these ‘water challenged’ areas leading companies, municipalities, and commercial property owners had no choice. If they wanted to grow they had to find more water; success or failure would ultimately determine if their community could live and thrive or shrink and die.

When my co-founders Chris Manchuck and Peter Carlson and I started HydroPoint in

2002, the more we researched the three main segments of the water network – Supply, End Use, and Treatment – the more we were convinced that it was the ‘Last Mile’ of the water network, the ‘End Use’ segment, that was going to be passed the brunt of the costs ‘Supply and Treatment’ was facing and would continue to face for the foreseeable future.

We knew that an economically compelling onsite water management solution would be a powerful game changer: a huge win-win for both business and the environment *and* our future.

What we didn’t know was just how hard eliminating water waste from the Last Mile on a sustained basis was going to be and how long it would take for site owners to understand the true costs of unmanaged onsite water use.



The United Nations announced a sobering forecast that by 2030 there will be a 40% gap in freshwater availability and increased demand on freshwater from the world’s growing population.

Source: International Resource Panel. (2016). Policy Options for Decoupling Economic Growth from Water Use and Water Pollution. United Nations Environment Program

Fresh Water Supply

Accelerating Pressures / Availability:

- Demand from a growing population
- Scarcity from droughts/climate change
- Systemic water loss from aging infrastructure
- Increasing costs due to energy cost increases
- Freshwater aquifer loss due to salt water intrusion

Fresh Water Treatment

Accelerating Pressures / Quality:

- Increasing prevalence of pharmaceuticals into watersheds
- Focus on the danger of forever chemicals and the increased costs to eliminate
- Growing legal costs due to unacceptable levels of lead in aged water infrastructure

Challenges in Managing Water Use

We knew that the Last Mile would be technically challenging. Of course, when we started, energy management had already successfully utilized Information Technology, wireless communications and data analytics.

But while onsite water management has some similarities to energy management, the differences are significant: energy use is always, by definition, near an energy source that can power your sensors, control devices and communications systems. Water management requires being where there may not be power with a challenging range of environmental conditions.

Water leaks, operational errors, and behavioral failures all have a bigger potential for damages and costs than energy waste. When someone leaves a light on at a site over the weekend the setback in energy saved is minor; if someone unknowingly leaves a major irrigation system on all weekend the wasted water can wipeout an entire year's worth of savings. Even a small site has the potential for huge waste, both in water and costs. When a window is left open over the weekend with the heat on, the energy is wasted but it exits the site without further damage. When someone breaks a high-pressure

lateral line and it blasts water on your unprotected site it can quickly damage the surrounding area and more in a few hours. Leaks can destroy your valuable inventory or bring your entire operation to a halt. In water management, the stakes are higher, access to water usage information is more challenging and there is less visibility.

While we were able to solve many of these challenges with technology, our biggest challenge wasn't technology at all – it was the wide diversity of the Last Mile. Supply and Treatment happen in a relatively controlled and uniform ecosystem where the operators are your employees and their skills under your control.

The Last Mile is, almost incomprehensively, diverse. The ecosystem is made up of a wide (and wild) range of constituents, vendors and visitors, with an unpredictable range of skills, weaknesses, motivations and honesty. After years of systemic water waste and no accountability for wasting water – no matter how damaging – the last thing many vendors wanted was real-time transparency in the form of a simple-to-read, real-time water 'score board' everyone could access.



Our first platform was only partially successful because we failed to understand that **the biggest obstacle to eliminating water waste wasn't broken pipes — it was people and institutional water blindness.**

We are in a new era of water use where it is no longer economically, legally or socially sustainable to continue wasting water.

Water Blindness

What you don't see, can be your greatest threat

When we first started HydroPoint we found one of the biggest obstacles for organizations to consider onsite water management was their blindness to the true total cost of unmanaged water use.

More than any other onsite resource, water issues are the hardest to see before it is too late. Water management like energy management is about controlling a powerful resource but water's destructive ability has an almost predictable pattern of going where it can cause the most damage hidden from your view to potentially causing a series of cascading damages and expanding liabilities.

Once organizations start looking at all of the costs of unmanaged onsite water use – not just increased water bills, but also lost time, increased risk and even potential brand damage – then they will be able to properly determine both the urgency and benefits of managing onsite water.

Today no organization can afford to be seen as a water waster. Water at the Last Mile is the most expensive water there is and wasting clean, transported water hurts not just your bottom line and water resiliency but your community's water resiliency as well.

Lack of real-time visibility of the **True Costs, Total Time Lost, & Ongoing Damages of Unmanaged Onsite Water**



Water blindness means discovering bad news too late.

Harnessing the Right Combination of Technology, People and Domain Expertise

For almost two decades HydroPoint has been learning how to manage onsite water effectively for a wide range of markets who own and/or manage sites. From corporate campuses to multi-family housing to military bases to parks to HOAs and many more, we have learned that each unique market and vertical has equally unique business requirements and goals. But getting to this point in our expertise first required looking at the problems we try to solve in a new way.

As I mentioned before, our first platform failed to properly engage the very people we needed to be successful with. To address this gap we made a major platform expansion. The results were immediate and the response from the market has been truly rewarding.

Our strategic pivot included:

1. Outcomes as a Service

First, we migrated to an Outcomes as a Service business, rather than a product features business focus. This new orientation meant working with our users in a focused and collaborative process that defined the outcomes they needed to achieve. Rather than just develop new features we made solutions using a wide range of integrated

components including Managed Services, Issue Escalation Engine, Big Data and Advanced Machine Learning, and Expanded IoT Architecture.

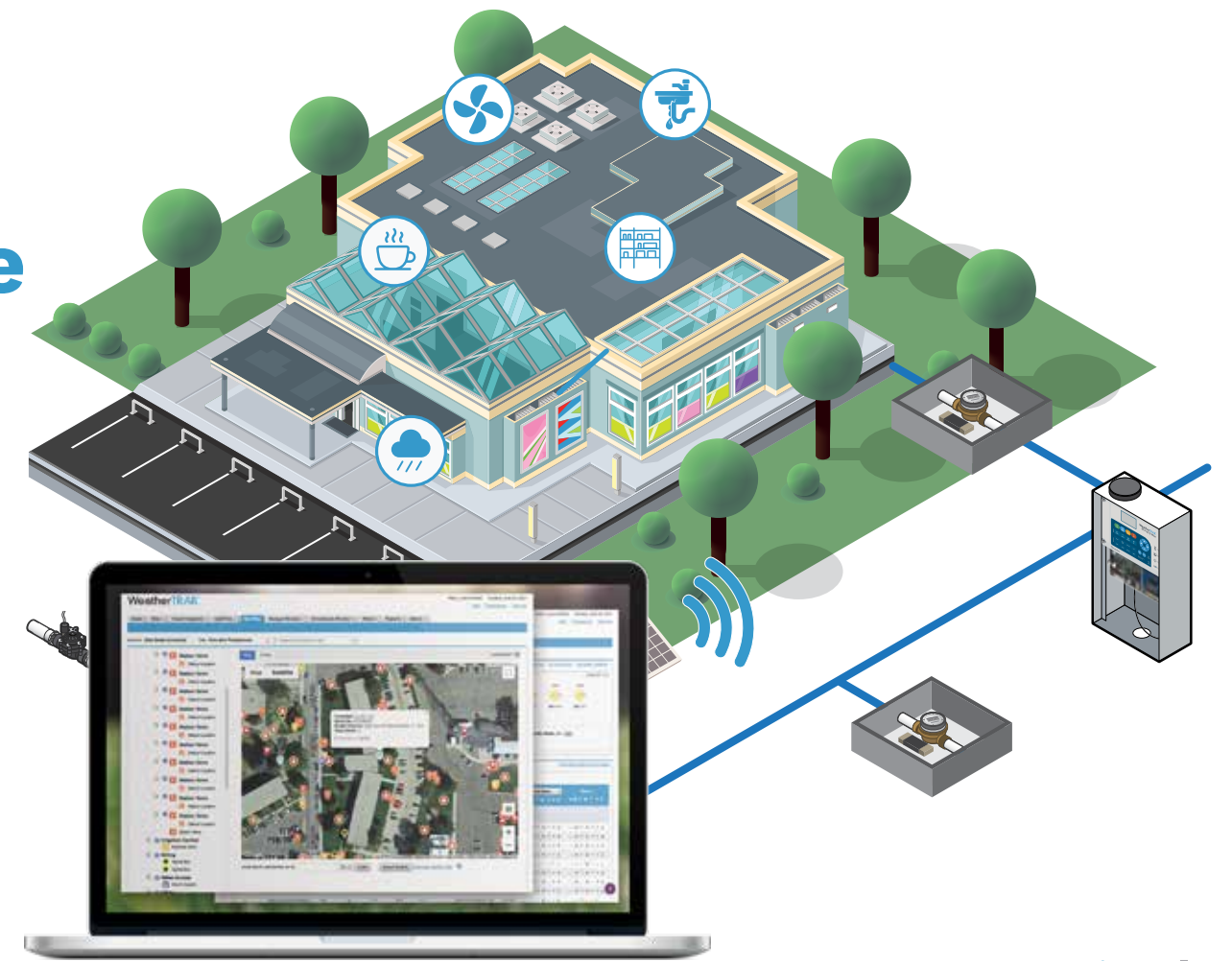
2. People Engagement Engine

We developed our systems and processes to actively engage all of a site's key constituents, understanding their goals and challenges and finding ways to help them do their job around common benefits we can both realize and productively promote. Our goal is simple: harness the powerful knowledge and domain expertise of your onsite field personnel.

3. Advanced IoT Technology

Onsite technology that is reliable, self-monitoring and easy to install and maintain, at the lowest total cost of ownership. Today our infield sensors and IoT network as well as our proprietary analytics are among the industry's best.

Each of these unique and powerful tools and processes are designed to eliminate water blindness by providing Onsite Smart Water Management – **both indoors and out.**



Case Study:

WeatherTRAK Smart Irrigation Controllers

Through our cloud-based system, landscape staff can remotely manage sites and make changes from the mobile app. Plus, at the first sign of a leak, broken sprinkler head or site issue, facility managers receive an alert.

RESULTS

• **\$5 million saved annually**
in water costs

• **Effectively reduced greenhouse gas (GHG) emissions**
by an amount equal to burning 84 thousand gallons of gasoline



WaterCompass Leak & Flow Monitoring

Managing Indoor Water Use

No site, sector, or vertical is immune to water blindness. Let's consider the most common commercial scenarios for water blindness and the accompanying HydroPoint strategies for tackling these situations. Inside any building large or small, deferred maintenance can lead to severe water blindness. From older infrastructure to drips, leaks, and breaks, there is large potential for water waste. Further, it takes energy to treat and transport water. Indoor water must also adhere to potability and sanitation requirements. From healthcare facilities to mixed-use commercial, residential and retail properties, indoor water use is further complicated by heavy foot traffic and interwoven ventilation and temperature control systems.

Technology can now extend beyond human limitations. Once, water assessments relied on-site visits and spot checks from a technician or maintenance person. Today, sites don't require that a person walk across an entire site and assess every bathroom, sink, or pipe. Current solutions afford higher site-wide visibility, even when no one is physically onsite monitoring.

Today there are better strategies for creating water visibility. They combine



the expertise of human assessments with data and technology that can make up for manual errors and limitations.

Indoor Water Visibility Solutions:

WaterCompass Leak & Flow Monitoring Service

With turnkey project deployment and device installation, the HydroPoint team of experts monitor your site water usage to determine anomalies, leaks, or breaks. The IoT sensors installed for this offering are non-invasive, so water shut-downs and cutting into existing pipes is not required. Immediate water use data

and visibility without any disruption to daily business operations are the result.

High-efficiency Appliances

From low-flow toilets to more sustainable showerheads and faucets, updating and retro-fitting internal water systems go a long way. If someone leaves one of those faucets or showerheads running, or if there's a leak, a backup monitoring and an alert system should be in place. When swapping out any appliances, always look for those that are EPA WaterSense or Energy Star approved.

Case Studies

FACT

Houston city council has approved a plan to raise water rates by 78% over the next five years.

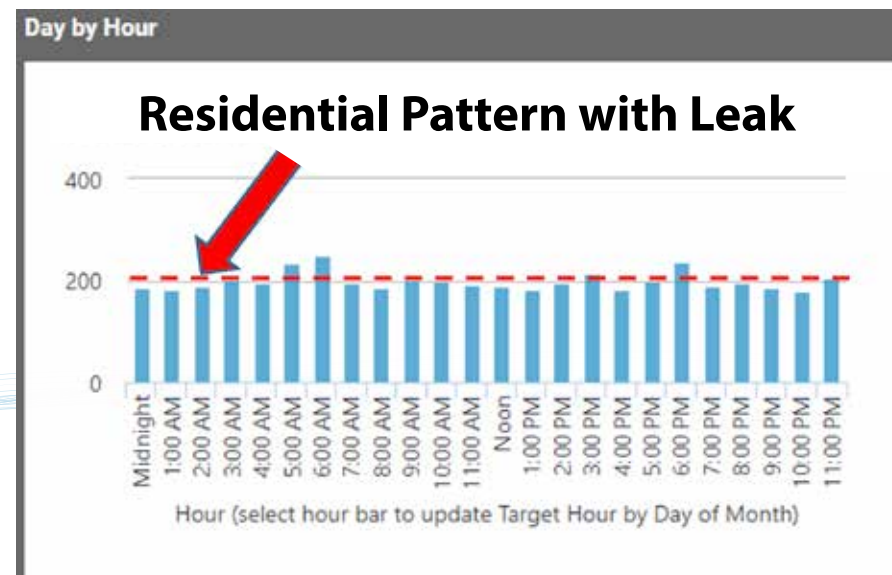
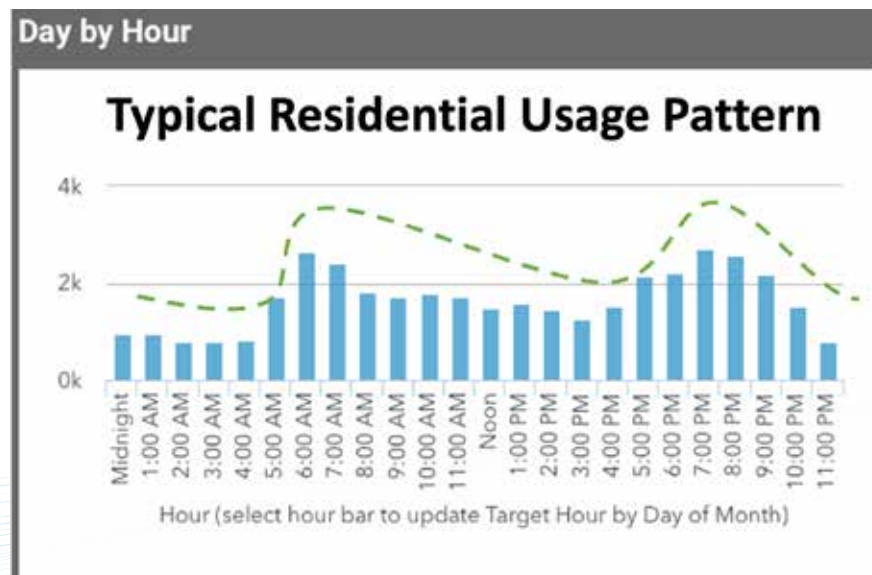
Customer Use Case: Detecting a Leaky Toilet in an Apartment Complex

In buildings with a large number of tenants, property managers can't always expect to be alerted to water issues as soon as they occur. When tenants forget or don't notice, leaks and breaks can spiral into larger problems. One apartment complex had decided to end their water blindness with the WaterCompass offering, providing leak and flow monitoring service. After several months, the HydroPoint team of experts noticed that their typical residential usage pattern had changed, there was water use during uncommon hours – at a consistent rate – signifying a water leak. And one apartment complex detected 200 gallons leaking each hour from various outlets. By notifying onsite teams at the apartment complex right away, they located a leaky toilet that had wasted 200 gallons and climbing. This immediate resolution saved over \$5,000, which provided them with an immediate return on their investment (ROI).



Customer Use Case: Food Preparation Appliances – Excessive Water Use

Upon initiating the WaterCompass service, the water use patterns for one retail mall were using excessive water – especially overnight when the building was closed to customers. HydroPoint worked with the mall's onsite team to discover that yogurt machines in the food court were using 4,000 gallons of water per hour, discharging water for 12 hours daily, all going into an open drain. This discovery led to savings of 2.6 million gallons of water annually, and \$172,828 in water costs for the retail mall owners.



Managing Outdoor Water Use

Landscape irrigation accounts for an estimated 60% of urban water use in the U.S., using billions of gallons of water each day. The opportunities for water waste are plentiful: from evaporation, wind, and runoff to improper irrigation system design, installation, and maintenance. Equipment can wear down over time. Also, irrigation systems often overwater or underwater based on erroneous automations and assumptions. So how can you reduce significant outdoor water waste?

HydroPoint solutions utilize data from various IoT sensors and devices to inform automations and irrigation scheduling. These include:

Soil Moisture Sensor-based smart irrigation controllers can measure soil moisture content. When buried in the root zone of turf, trees, or shrubs, the sensors accurately determine moisture levels in the soil and transmit this reading to the controller, where it calculates the exact amount of irrigation needed based on real-time soil environment.

Weather Data Weather-based irrigation controllers, WeatherTRAK is an example, also referred to as evapotranspiration (ET) controllers, use local weather data to adjust irrigation schedules. These controllers gather local weather information and make irrigation run-

time adjustments so the landscape receives the appropriate amount of water. HydroPoint onsite weather data is accurate to a half square mile, which means no additional on-site weather station is needed to obtain weather data.

Flow Sensors These sensors can determine how long it takes an ultrasonic wave to travel between two dual-beam sensors, with and against flow. If water is moving, the wave against the flow slows down, and the time difference between the two determines the flow rate. The data obtained from flow sensors shows if there are any water leaks or breaks, or clogged pipes or aging infrastructure. Take the technology up a notch by opting for one with a built-in master valve – which you can set to automatically close or shut off if there is a water leak that exceeds a specific threshold.

2-Wire Technology These systems use two separate wires that travel from the central controller to the valve. The valve has a decoder that acts as the “brain”, which allows controllers to turn valves on and off according to schedules.

Precip Sensor A precipitation sensor collects precipitation data. The Baseline Precip Sensor uses Tipping Rain Bucket technology to work with the irrigation controller to determine how much of that rainfall was effective in soaking into the soil to be used for irrigation. This provides real-time rainfall data remotely including rainfall intensity, duration, and effectiveness.



Baseline Soil Moisture Sensors

These sensors use patented technology called Time Domain Transmission to measure volumetric soil moisture, accurate within +/- 3%, regardless of soil salinity changes or other factors. This highly accurate sensor provides a new level of data granularity, measuring changes of less than 0.1%. This pioneering device is the gold standard in the irrigation industry and is the first to receive EPA WaterSense certification for a soil moisture-based irrigation controller.

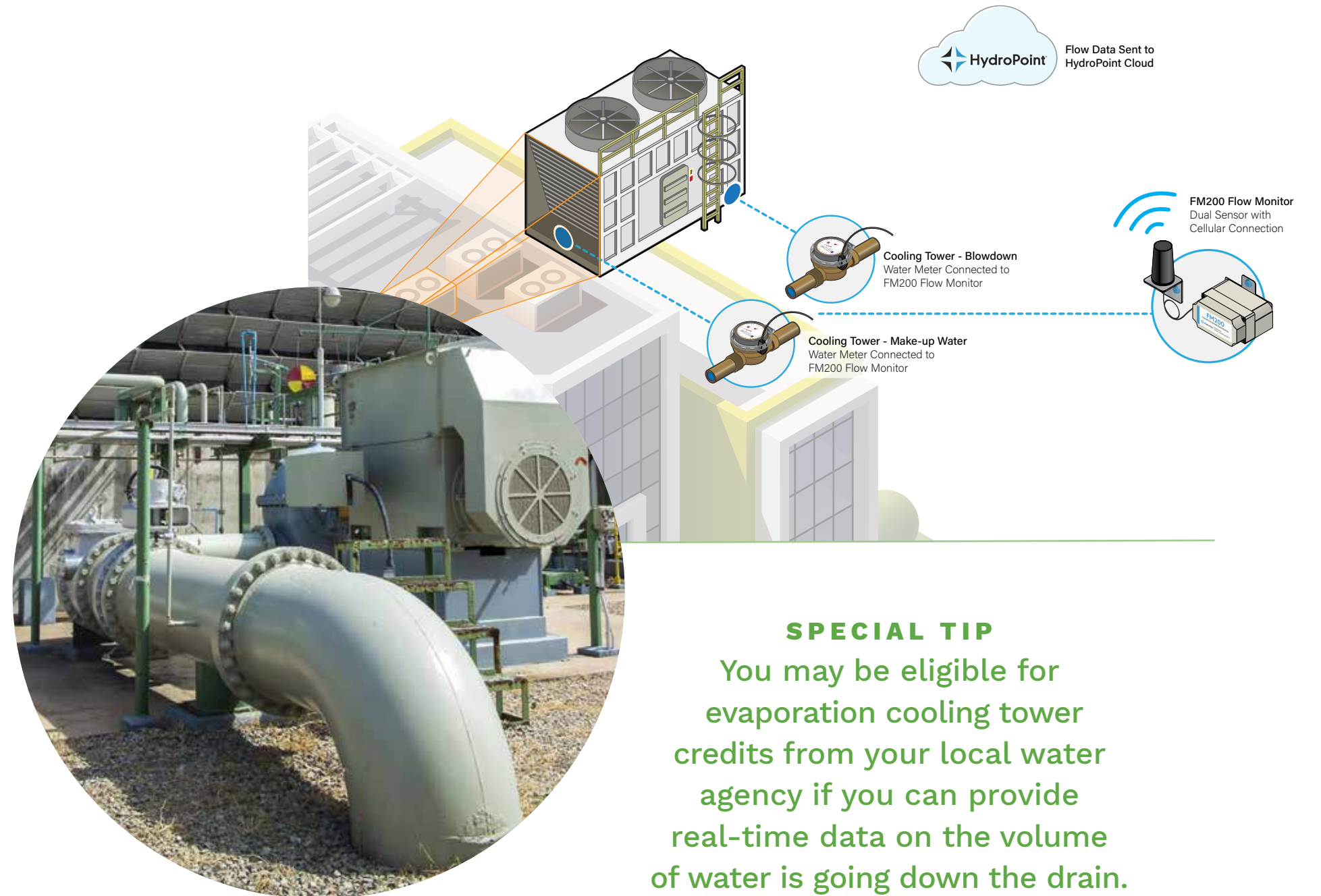
RESULTS

Using a soil moisture sensor can **reduce water use by as much as 62%** versus traditional irrigation methods.

Cooling Towers As global temperatures continue to rise, it's more important than ever that a building's cooling towers run efficiently. Cooling towers are large consumers of water, and potentially an area for either massive water savings or massive water waste, depending on your approach. There won't be humans or foot traffic interacting with these systems, but they are incredibly important.

Water can escape from a cooling tower in several ways. Through evaporation and mist, primarily. Also through blowdown, when water is drained from the cooling tower to remove mineral buildup. Lastly, basin leaks and overflows can account for large amounts of water loss. Cooling towers work hard and use a lot of energy making up for these water losses.

Single-pass cooling can use up to 40 times more water than a cooling tower that operates at five cycles of concentration. Eliminating single-pass cooling is one of the most significant steps you can take to reduce water use. Additionally, find ways to reuse any water runoff.



SPECIAL TIP
You may be eligible for evaporation cooling tower credits from your local water agency if you can provide real-time data on the volume of water is going down the drain. The WaterCompass offering from HydroPoint can automatically track this volume for you.

Outdoor Water Features From swimming pools to complex networks of fountains and water features, each site has unique water features many times with their own set of pipes and systems – many that lead to water blindness. Leaks or breaks in these systems can cause them to operate inefficiently, wastewater or cause damage to the building or property. Site managers may not even be aware of these inefficiencies. That’s why it’s important to invest in solutions like Water-Compass, which can offer real-time monitoring of an entire water infrastructure

For outdoor landscapes of all shapes and sizes, remote management does more than just save water. It reduces truck rolls, site visits, staff time and major headaches. It lessens the carbon footprint of the property, helping to hit sustainability goals and be kinder to the planet.

Leaks in outdoor systems can cause them to operate inefficiently, waste water or cause damage.

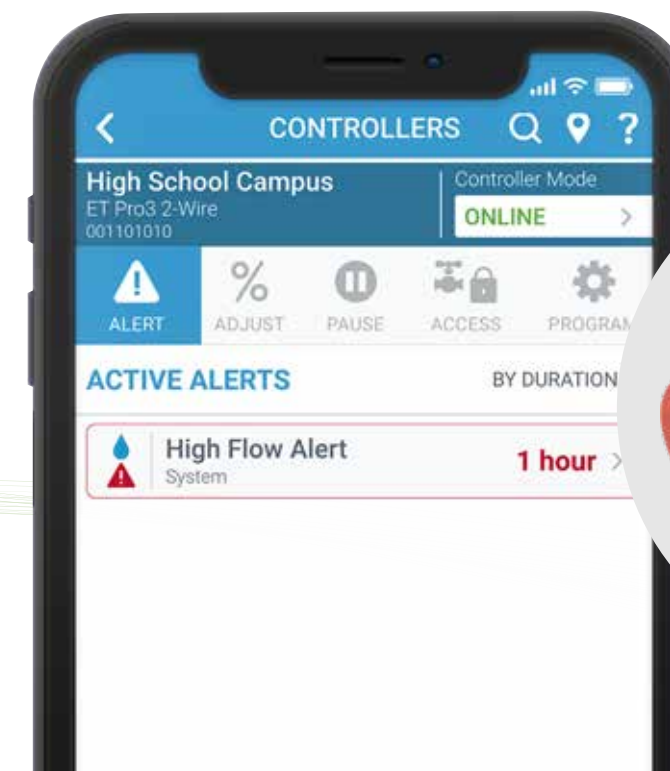


Customer Use Case:
Soil Moisture Sensors in Green Roofing

In Menlo Park, one technology giant’s corporate headquarters houses a 9-acre green roof. The roof garden includes shrubs, walking paths, perennials, and seating areas. Two Baseline smart irrigation controllers run the entire campus, one installed on the ground and one on the roof. **From a single point of connection, 190 irrigation zones interface with 25 soil moisture sensors.** The entire system functions to maintain the desired moisture level that ensures plant health, and an enjoyable landscape environment for the employees at the organization.

Customer Use Case:
Flow Sensors on a School Campus

One customer’s high school campus suffered a severe irrigation leak over a long weekend. No one on the deserted campus was around to witness the leak. However, **HydroPoint’s flow-sensors detected the abnormality and alerted an after-hours technician via the mobile app.** The technician was able to address the leak before it turned into a catastrophe, and avoided any school closures or student learning disruption.



HydroPoint

Your partner in smart water management for the last mile.

HydroPoint eliminates water waste and water related damages for the 'last mile' of the water network: water end-users. Our customers range from cities and schools, to Fortune 100 corporations, from military bases to the world's most well-known technology companies.

For over fifteen years we have helped many of the country's leading organizations eliminate water waste, damages, lost time and increasing liabilities unmanaged water causes each hour on sites across the entire country.

HydroPoint's growing list of customers has proven that these increasing costs and liabilities are now avoidable. Property owners who use HydroPoint now see their water-wasting sites in a new light instead of incurring more and more costs each year because water management is too difficult or time-consuming to address. Today these sites are opportunities to 'harvest' substantial cost, take out or reduce liability, *and* achieve measurable environmental gains. Property owners can now save money and increase their corporate water resiliency while achieving recognized Environmental, Social, and Governance (ESG) goals that benefit both the local community and the world.

HydroPoint can help organizations eliminate water blindness with proven solutions that deliver water and money savings to customers.



About HydroPoint

HydroPoint® is the proven leader in smart water management solutions. Its WeatherTRAK®, Baseline™, and WaterCompass® product lines help companies maximize water savings, reduce operating costs, minimize business risks, and achieve sustainability goals. An EPA WaterSense® Partner of the Year, HydroPoint combines IoT technology, data analytics, and automation to optimize irrigation, flow management, and leak detection. Its solutions deliver visibility and control to commercial, government, education, and community sites.

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