

Rukmini

Could you both introduce yourselves real quick for our listeners?

Karen Galt

Sure, I'll go ahead. I'm Karen Galt. I'm your water management coordinator at Seattle Parks and Recreation. I've been at Seattle Parks for about 26 years now as a landscape architect. And for about the last 15 years, I've been working in sustainable operations focusing on water management.

Tyler Flynn

Yeah, hi, I'm Tyler Flynn. I'm the water management specialist for Seattle Parks and Rec. My work is primarily focused on the operations side of water management. One of my main duties is monitoring our irrigation citywide through our central control systems. I also work with and train staff to operate and set up controllers and schedules as well as troubleshoot and perform field maintenance.

Rukmini

Thank you both for being here. So we invited you on this podcast to talk about water audits. And I know that that's kind of a vague term and it's also pretty broad. So could you all give some context on what we're actually going to be talking about today?

Karen Galt

Yeah, sure. For us, we look at water audits in a couple of different ways. One of them is really looking at water use data. So that's one aspect. Another side of the water use is on buildings and facilities. And kind of the third and more traditional thought around water audits is in irrigation systems. So we're going to be talking about each of those separately.

Rukmini

All right, great. Can you tell us how water audits fit into the broader conversation on water conservation? So how do they fit as a tool in your tool belt in Seattle Parks and Recreation?

Karen Galt:

Yeah, so to answer the question about how water audits fit as kind of a water management tool for our department, I mean, for us, the major benefits to it are really looking at water savings. Responsible water management is not always about water savings, because you can only save so much before you're starving your landscapes.

Rukmini:

Can we start with the data? Could you give us some background on your data and how you're looking at water use in your systems in Seattle?

Karen Galt

For sure. Yeah, so we've been maintaining a water billing data set for going on probably 15 years now. And it's super helpful. We end up getting from our utility a monthly upload of bill data. And we're able to use that. We basically check it once a month. We kind of do this upload process and analysis and look at it for where we've got some kind of like high bills or unexpectedly low bills sometimes.

But generally we're looking for high bills and that's kind of an early trigger for us that there may be some kind of a water issue that we want to go out and troubleshoot more. We also get like flagged from our accounting staff if they see something coming up quickly and sort of unusual in the billing set and we'll take that and go out.

It's usually just kind of a trigger to be like, what's going on here? And then you have to go do the physical work of actually figuring out what's going on. It's not always reflecting that there's like a actual water problem. Sometimes it's just a billing problem, but that's like equally important in sort of our overall water management. One side we're trying to look at where we can save and conserve water. The other piece of that is we're paying for that water. So we want to be mindful of that as well.

Rukmini

Okay, so you talked about how the water use data will sort of flag things for you. So if it's unusually high or unusually low, could you give an example of when you might have seen something that's like a flag to you and what you did with that information?

Karen Galt

Yes. Yeah, so we've got a couple examples. So one I'm thinking of is at one of our tennis center locations. Just in the course of our regular review of the billing data, we were seeing some unusual use, it was maybe three or five times what it should be. Specifically, we start to dig in to see whether it's likely to be on the irrigation or if it's on the building. So we've got both systems at that park.

And so really getting into the weeds of that, we try to see where the water use is showing on which meter. We can sort of see some of that on the bill, and that'll give us a clue of where to go look out in the park. Once we kind of have that dialed in, then we can go to the park and physically look on the meters, see if the meter is spinning, if there's actually water running somewhere, and kind of verify where it is. Then you literally just start walking around and looking for wet spots if you think you've got a leak.

Or if you're not seeing something obvious but you're seeing the meter move, then you might reach out to staff that are on the site on a more regular basis and say, hey, have you noticed any problems? And kind of just start troubleshooting down until you find the source of the problem. In this particular example, it was pretty straightforward because it showed up on both the main meter and our irrigation sub-meter. And like 10 feet away from that sub-meter, there was a big pool of water that just was where a pipe had broken. That was pretty straightforward.

Another kind of recent example was where we were just reviewing the billing data again and kind of saw a flag of a park that had zero use for a long time and then suddenly had 1,000 ccf of just 100 cubic feet. That's how our water's measured here. Of water on it, we're like, what's going on? This seems really unusual.

And so we were able to go out, look at the meter reading and say, hmm, actually this is a billing error that our utility didn't read the meter correctly. And so rather than paying for that

bill and not knowing there was a problem going on, we're able to say, hey, here's a picture of the meter. Please give us a credit on that bill.

Rukmini

Thank you for sharing those examples. I think it's really helpful to see what the response is from that, since with the review you're able to see those flags and then you're able to kind of move on that quickly. So when we're thinking about agencies who might be wanting to do more thorough or more consistent reviews of their water billing data, what are some challenges they might face or what are challenges you face in doing this work? And can you talk about the ways that you've overcome those?

Karen Galt

Yeah, I mean, think one of the challenges is just having like long term data kept. And so it's been, I would say that's a strong recommendation. Like our utility doesn't even keep the data as long back as we do. And so for us to be able to go and compare many years back has been a very helpful tool.

For us, the whole size of our system is huge. We have, I think, like 600 water meters. And just thinking about staffing to kind of manage and be able to keep on top of all of that. So just kind of having dedicated staff to do that work and just being routine about it is kind of the way. Don't wait for the surprises. Just make it a regular part of your routine.

Tyler Flynn

I would just add for my part, when we get sometimes high bills or bills that are low, I'll also like cross-reference, yeah, like our central controls and irrigation systems. And so there's sometimes there'll be parks where we know that irrigation is running and I will double check that, that's getting like estimated meter reads or zero meter reads, I'll go out there and like check the site and see if the meter needs to be replaced and stuff.

Rukmini

Okay, so we talked about water use and data and sort of reviewing that on a monthly cycle. You also mentioned two other types or two other lenses for your water audits, which is

facilities and then irrigation. So can we move to facilities and you give us some background on what that looks like for y'all?

Tyler Flynn

Mm-hmm.

Karen Galt

Yeah, so water use in parks for us, just broadly speaking, and this may be typical for other park departments, but are kind looking at our whole water portfolio. For us, about three quarters of our water use goes to irrigation. So that's where we spend a lot of our time.

However, there's a lot of other uses, water uses in parks that happen at buildings or facilities. We've got swimming pools, we've got community centers, have spray parks, we've got other non-irrigation uses, lot of administrative buildings or crew quarters, for example. So probably, again, this is about 15 years ago, we kind of initiated this big push to do a lot of resource conservation management.

And in the water area specifically, we did a big push of going through and just doing kind of all of the stuff that now feels like common sense, common activity, but is putting in low-flow toilets, putting in aerators and sinks in these buildings. I think there were some efforts to change out shower nozzles at the swimming pool showers. We tried low-flow toilets in a couple of situations, like in buildings or in our restroom buildings out in parks.

One of the, I guess, so that's kind how we got started, was basically hitting all that low-hanging fruit of those type of typical retrofits that are, you know, you just hear about those everywhere. Some that were slightly more novel and kind of tied to the energy conservation side also were doing, installing like pool covers.

So every night when the pools were closed, they would get a cover on which would reduce evaporation as well as manage the energy used to heat them. So that was kind of A dual purpose conservation effort there. So since that time, there was a lot of good work done. We had some lessons learned and we made some changes as a result of that. So I'll just give the example, I mentioned the toilets.

And so we found that that worked fine in a community center, but not so great out in a standalone restroom building in a park. And so one of the things that we kind of faced, one of the challenges that we face around this is like, how do you balance conservation, know,

maintenance, kind of longevity of the system and customer service, like all of these things at once.

So, you know, in our outdoor restrooms, we ended up going back to, you know, more regular flow toilets, probably back to the, I don't remember the gallons exactly, but so they were higher gallons just because the stuff that we were finding out in parks was not going to work with a low-flow toilet. And then I think I remember also at the pool showers was another one that was like, if they would get too low flow, then the temperature regulation was a challenge. And so some of those got put back.

So that was a interesting kind of a takeaway from some of that. So one of the things that we have done since then is just as our facilities go through maintenance, scheduled maintenance closures about every 18 months where they'll close the building for a couple weeks and we would try to go out a week or two before that and just do a quick little audit and see what got that needs to be replaced or changed or tuned up from a lot of those low flow fixtures for example.

See if there's anything that we could fit in with that regular closure to just kind of keep on top of it. But there has not really been a lot we've done needed after that first push. So it's sort of become just routine maintenance since then.

Tyler Flynn

I think I would just echo the concept of needing to meet all of the needs of the park users and the facilities and just being able to truly maintain it. There's some sacrifice and balances that have to be made.

Karen Galt

Yeah, I think just building on that too is just kind of yeah, it's definitely like balancing a lot of different goals at any one time. And also just thinking about, that's kind of why I mentioned in the beginning about where the water use is in the department. It's like, so you might just think the changing out that aerator is the most important thing, but it's a tiny percentage of your overall big picture. And so you just kind of figure out where it's going to meet customer service, maintenance needs, and save water.

Rukmini

What advice do you have for parks and recreation agencies that might be, earlier on in their water conservation journey, who might want to implement these types of tools in their facilities? Is there anything specific, any tips that you would give?

Karen Galt

I think just sort of being intentional about it. Start with the easy pieces, make a plan. Most places throughout the country now have rebate options. Definitely work with those. That was a big part of our early work. So, yeah, most utilities now will have some kind of a program where you can make some conservation improvement and they'll help you pay for that in one way or another.

A lot of them the savings will you know kind of pay for itself in the short amount of time. So I think just get started, make a plan, make sure you're coordinating with the folks that will be maintaining the equipment or whatever you know changes that you're proposing to do and then you know be flexible, learn from what you try and you know be willing to have a backup plan.

Rukmini

Okay, great. Thanks, y'all. So I want to move us into our third section here, which I'm excited to dig into because you mentioned early on that irrigation is, I think you said like three-fourths maybe of your water usage. Is that right?

Karen Galt

Yeah, yep.

Tyler Flynn

Mm-mm.

Rukmini

And so I want to get into the irrigation audit. In our conversations, you told me that what you do is not exactly a classic irrigation audit. And so I'm excited for you to sort of provide a different model for folks. Can you talk about how you do irrigation audits in Seattle?

Tyler Flynn

Yeah, so I guess I'll start by maybe explaining what a traditional irrigation audit looks like. And it's a bit more involved in what we're able to do across the board. But it generally requires running through the entire system and you putting out like catchment cups and checking like pressure on every sprinkler head and that's just very time consuming and requires a lot of staff with the volume of parks that we have.

So while we kind of do that on newer installations and in some specific cases, most of our sites kind of receive what I would call a functionality test where every season the plumbing shop will go through and they'll do checks on our backflow regulators and making sure that those are functioning well. Turning on the water is just a huge production of trying to get all these sites up and running.

From there, our park staff district or myself will go through the controllers, make sure that everything is set correct and like communications are happening and then we'll basically run through each zone making adjustments as needed. So that can look like replacing sprinkler heads, turning on or off valves that may or may not be working, replacing nozzles and essentially just ensuring that we're getting maximal coverage of our irrigated area with minimal water wastage.

When it comes to irrigation, having an efficient system is their most important tool for conserving water. Like an efficient system is conservation. Excuse me, so checking that all of the zones are properly suited to the needs of the landscape can go a long ways with water savings because like I said, three quarters of it of our water use in parks is irrigation where like if you were to compare it to flushing a single toilet is like that gets put out into the landscape in like a minute or something of runtime.

I would say it's pretty exponential in terms of like how quickly your water can rack up with irrigation. So just going through the park diligently and getting everything in order really goes a long ways. Yeah and you know the name of the game for us is to also provide a happy and healthy landscape for everyone to use so we're gonna make sure everything's getting irrigated well.

Rukmini



I want to ask, I know you all mentioned like doing a classic irrigation audit is a really big lift. It requires a lot of resources. And you mentioned, you know, how y'all are addressing that. Do you have any examples of like other agencies, peer agencies, and how they might be using this tool of a water audit?

Karen Galt

Yeah, I'll take that question. Many years back when we were, I'll say dipping our toes in the water audit world, I was able to get some information from Portland Parks, which was really pretty, kind of a fun way to do water audits. But basically, they were doing, they did a interdepartmental water audit competition.

So they had different park districts I think within their parks department and they basically had them go through and do actually a full traditional water audit of measuring cups etc. And then so that happened like in two different park areas or something and then they went through and out of one of those traditional audits you come up with kind of a big to-do list which is a lot of the things that Tyler mentioned in terms of a system, spring startup too so you find out that you've got really low water application rate in one area and really high in another and you're trying to balance that out.

So you might be replacing heads or adjusting nozzles or resetting an angle on a head or something like that to get more uniform coverage is kind of the goal. And so each park went through, did their audit, made those adjustments, came back and did another audit to kind of see what the benefit was. And so I don't remember what the prize was out of that, but it was basically, maybe it was pizza lunch or whatever, but just kind of a way of, you know, using that as a tool to skill build even within the department and get the actual benefit of having done the audit and making the adjustments.

So that was a pretty neat example and I think that could be a fun way to leverage the idea of an irrigation audit without having to do it everywhere, but you could sort of start to get some more of those skills more broadly distributed.

You at least have people understand the importance of that uniform coverage. And then another example that came up somewhat recently here in Seattle is we've been in a multi-year waterfront redevelopment. I'm not sure if it's made the news across the country or not, but we had a large viaduct that basically ran along the waterfront and was taken down maybe 12 years ago now.

And they've been building this basically park-like promenade along our whole downtown shoreline, which is fantastic and people should come see it. This is a very high-profile location and so as a part of that contract they required that the irrigation contractor hire a third-party auditor to come in and do basically a full irrigation audit on the system that was performed, the auditor came out, they had their little precipitation cuts, they made a very long document of detailed information which was then shared with the current gardening staff who will be managing the irrigation going forward.

And the gardeners there were super appreciative of getting all of that detail because it really helped them kind of start to get more familiar with the system and kind of see. Another thing that you can get from an audit is recommended run times. So if you're not using weather-based scheduling, for example, but you just need to know how much time to run an irrigation zone, an audit is one way that you can get there by measuring the precipitation rate on that. So anyway, the waterfront was a pretty neat opportunity for us in Seattle, a little bit more of a rare situation where we'd be doing that full-blown audit.

Rukmini

Yeah, I appreciate you sharing sort of the scale from like a full blown irrigation audit to something that's maybe more achievable, like your spring startup checklist. And I'm wondering, what do you think is the first step or how do you start moving in the direction of more consistent audits with regards to irrigation? Where could people start to find their footing and kind of scale up to be able to achieve those larger goals of the full blown audits?

Karen Galt

Mm-hmm.

Tyler Flynn

Yeah, I mean, I would say so a big one for us that is kind of a challenge is communication across like working units. We, in order to even do a startup, there's some communication between the plumbing shop, the gardeners and sometimes even like the electrical shop. And so it really, I think why like the Portland example is awesome is because so much of it comes from just awareness and seeing a clear example of how beneficial doing a full audit can really be.

I think pulled from the Portland example that they saw an increase of like 138% at one of these parks or something, which is just phenomenal. So, getting everyone trained up and appreciating that kind of thing is really pivotal to doing full blown audit. And in that same vein, like staffing and time, I would say if you're gonna try and do audits, start them as early as possible.

Starting as early as possible is huge for doing audits, coordinating with the staff and running it through it as quickly as possible. And if you are capable of fixing it right then and there, that's great. A lot of times the kind of cases you see it and might have to circle back or again communicate with other people to get the problems fixed and so just bringing it up to like that kind of functional level.

Karen Galt

There's a lot of great resources through the Irrigation Association, which is a national association, and they do a lot of advocacy around water conservation. They also do a lot of training and certifications.

And one of the certifications you can get with them is as an irrigation auditor. And so one resource that they have will be a list of certified auditors in your area. And so one idea might be for a parks department who's maybe not done this before is just to find someone who's certified in their area and have them hire them. They shouldn't cost a lot. It's a few hours of time and they're writing up a report.

But to have them come out and do an audit, and use that maybe as an opportunity to train some of their staff to do them going forward or just reaching out and finding when those classes are offered either through the Irrigation Association or sometimes I'll do those at things like the Annual Irrigation Show which is another national conference.

Rukmini

Thank you for sharing those resources.

Karen Galt

Yeah.

Rukmini

I think, you know, as we're wrapping up here, I really appreciate that you all have shared sort of what these three different types of water audits look like in Seattle, kind of what the challenges are with each and some strategies to overcome them, and then where people can go for additional resources. And you also shared some cool examples from other agencies that have managed to kind of like gamify this process or make it a little bit more accessible. And with that, like, know, focusing on staff education and bringing people along in this process. Is there anything else that y'all want to mention about this before we wrap up here?

Karen Galt

I think a lot of water conservation has a strong theme of every drop counts and it all adds up that kind of thing. It's totally true so it's one tool in the toolbox. There are many and doesn't have to yeah so would say try as many tools as you can and it will help. All of it will help.

Tyler Flynn

Mm hmm. Yeah, I would I would say as well, like, I think a lot of people who are going to be listening to this podcast are aware of how important water conservation is. But, you know, when it comes to sometimes like training staff and everything, just like spreading that awareness can go like a really, really far away. They might it might like spur something in them to get more involved. And every- everybody can do their little part.