

Interview with Mike Markus and Carl Yates

Progress Through Participation

At WRF's annual Subscriber Appreciation Breakfast, Orange County Water District (OCWD, California) and Halifax Water (Nova Scotia) were named as WRF's 2018 Outstanding Subscriber Award recipients. Formed 85 years ago, OCWD manages the region's groundwater basin, ensures water reliability and quality, prevents seawater intrusion, and protects Orange County's rights to Santa Ana River water. Halifax Water provides drinking water, wastewater, and stormwater services to over 365,000 people through 23 treatment facilities. A subscriber of the legacy Water Research Foundation since 1989, Halifax Water has been active both in research planning and project participation.

WRF sat down with Mike Markus, General Manager at OCWD, and Carl Yates, General Manager at Halifax Water, to learn more about their utilities' successes.

Mike Markus, General Manager at OCWD

What does receiving the Outstanding Subscriber Award mean to OCWD? We're humbled by it. OCWD has been doing research since the late 1970s. This research has helped us understand the mechanics of the treatment process better and allowed us to refine our process so that we can provide safe drinking water at the lowest possible cost.

Is OCWD involved in any current WRF projects? We are currently involved in the project, "Evaluating Post-Treatment Challenges for Potable Reuse" (Reuse-16-01). We also have two other ongoing WRF projects, one on kinetics modeling of chloramine photolysis in UV-driven advanced water treatment, and one on NDMA method development.

So that's three current projects where we are either receiving WRF funding or matching funding. OCWD is also represented on at least 10 Project Advisory Committees, and we are a participating utility on at least 10 other additional projects.

What are some of the biggest issues OCWD is facing where future research is needed? Potable reuse is still a very relevant topic for us. Even though OCWD is not considering a direct potable reuse (DPR) project—we're just continuing to successfully run our indirect potable reuse project—we're very watchful of DPR research outcomes,



because I think they will be very applicable to indirect potable reuse.

It's going to be important for WRF to be on top of what is happening with legislative and regulatory initiatives. In California, we tend to be a little bit ahead of what the feds are talking about for regulations, including new requirements for CECs testing. There's going to be more data generated in California, and it's going to be important for WRF to help the industry put it in perspective.

OCWD is a One Water utility. Why do you think the industry has moved in this direction? We've known for a long time at OCWD that we need to recycle our wastewater and make more use of the water we have. I think our groundwater recharge operation is a nice representation of the whole One Water approach because, essentially, we recharge stormwater supplies and we recharge Santa Ana River surface water supplies, a portion of which is wastewater. And we of course have our recycled water project.

We had to look at the entire mixture and shore up our water supply reliability for our member agencies. My hope is that once we look at water as One Water, we can bring all the research together, avoid duplicate efforts, put the best minds together, and solve water problems.

Carl Yates, General Manager at Halifax Water

What does receiving the Outstanding Subscriber Award mean to Halifax Water? It's an honor to be recognized by our peers as a recipient of the Outstanding Subscriber Award. We have always promoted research, and that's why we've been involved with The Water Research Foundation since 1989.



How has Halifax Water used WRF research to further its goals over the years? WRF really morphs with the industry and anticipates where it needs to go, and usually gets the research done before too many people are out on the edge, not knowing where they're going. It's been great to have some guidance from WRF on emerging issues.

Are there any particular WRF projects that Halifax Water was involved with that had significant impacts? One project, *Leakage Management Technologies*, looked at ways to control pressures through flow modulation. At night, with less use, water system pressures creep up, and that's when we get most of our water main breaks. Through this research, we were able to make automatic adjustments to reduce pressure and therefore reduce leakage and the opportunity for breaks.

We always try to have at least two feeds into our district metered areas (DMAs) for water quality and reliability reasons. The initial prototype for flow modulation had some limitations; one feed always dominated and shut the other one down. Since they are hydraulically connected, when one feed responded with a reduction in flow, the other one would give more flow, and of course the first feed would then reduce its flow further. We were initially unable to get the dual flow to work. As a result, we decided to do further research. Research is not necessarily a destination, but rather a journey. And that's what's great about working with WRF—you do research to resolve some things, but then you have more questions, branch out from there, and take a deeper dive.

Another WRF project, *Energy Recovery from Pressure-Reducing Valve Stations Using Hydrokinetic*

Turbines, resulted in Halifax Water becoming the first utility in Canada to put an in-line microturbine within a closed distribution system. Instead of installing a pressure-reducing valve to knock the pressure down because it's too high to serve our customers, we put in a turbine. This not only reduces pressure, but also generates electricity! Today we have a turbine generating 32 kilowatts, which gives us \$32,000 per year in additional revenue.

What are some of the big issues Halifax Water is facing? Historically, in New England and Atlantic Canada, we felt the impacts of acid rain. As a result, the pH of our surface waters went down and became more acidic. We developed our treatment plants on that basis. In the 90s, the United States adopted stricter air emission standards for fuels and shut down many coal plants. With these changes, there's less acid rain and our lakes are recovering. Instead of a pH of 5, now the pH in the lakes is around 5.5, and they are becoming biologically active. Our ongoing WRF project is looking at the implications of this—we want to find out what modifications we need to make to our treatment plants, and we also want to investigate how high the pH might rise in the future. This research is not just important for Halifax Water, it is important for a lot of utilities in this region.

What do you see as the future of the water sector? Water needs to be managed as holistically as possible, and that's obvious to us at Halifax Water, since we've been a One Water utility since 2007. Not only do we see links between drinking water, wastewater, and stormwater, but this also reinforces the other connection, the water-energy nexus. You can mine the entire water cycle for energy optimization and recovery, from the source to the tap, and back to the source again. It really causes us to take that bigger picture look and not remain in silos. Water knows no boundaries, and therefore The Water Research Foundation should know no boundaries. [🔗](#)