



Metropolitan Water Reclamation District of Greater Chicago

# Press Release

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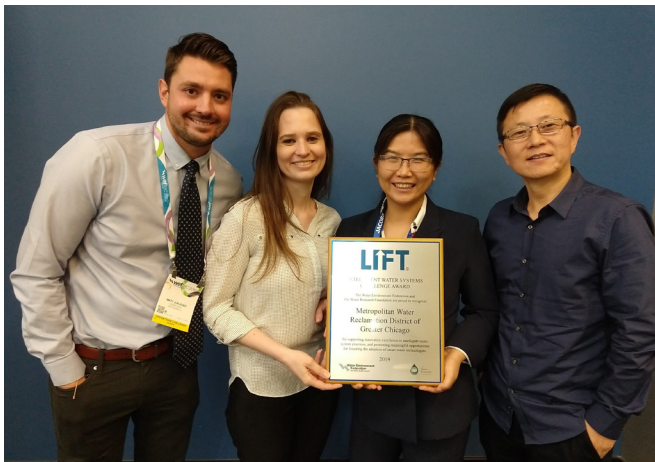
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## Bright minds deliver intelligent water systems at the MWRD

*MWRD scientists and engineers team up with ISU to win coveted award*



*From L to R: MWRD Senior Engineer Matt Jurjovec, MWRD Environmental Research Scientist Thais Pluth, MWRD Senior Environmental Research Scientist and team leader Fenghua Yang and Illinois State University Professor Yongning Tang celebrate their award-winning presentation.*

For the second year in a row, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) captured second place in a national competition challenging staff and research partners to leverage existing data and sensors to help utilities develop models that predict and optimize operations systems.

The team of scientists and engineers with the MWRD joined professors and students with Illinois State University (ISU) to create a system that optimized chemical usage to control odors and corrosion issues at the MWRD's Kirie Water Reclamation Plant in Des Plaines. They presented their data collection and advanced modelling simulation during the Water Environment Federation's Technical Exhibition and Conference (WEFTEC) at the 2019 Intelligent Water Systems Challenge, hosted by the Leaders Innovation Forum for Technology (LIFT), a joint effort of the Water Environment Federation (WEF) and The Water Research Foundation.



*From L to R: MWRD Senior Engineer Matt Jurjovec, MWRD Environmental Research Scientist Thais Pluth, MWRD Senior Environmental Research Scientist Fenghua Yang, Illinois State University student Kyle Francq, and ISU data analytics professors Xing Fang and Yongning Tang spent months researching ways to reduce corrosion and odors through more efficient operations using machine learning tools.*

“We appreciate the efforts of our team and partners at Illinois State University to put forth a concrete plan that is both technical yet practical in addressing odor and corrosion control at the Kirie Water Reclamation Plant,” said MWRD President Kari K. Steele. “It is our hope that this visionary research can be not only utilized at Kirie but expanded to other water reclamation plants.”

The team, led by Senior Environmental Research Scientist and team leader Fenghua Yang, handling utility research, MWRD Environmental Research Scientist Thais Pluth, overseeing utility research data management and MWRD Senior Engineer Matt Jurjovec, working on operations management, leveraged data using artificial intelligence tools to produce better decision-making for plant operations. They teamed up with ISU researchers to gain a better understanding of water flowing into the *(continued)*

## Bright minds deliver intelligent water systems at the MWRD, *cont.*

treatment, allowing them to create several machine-learning models to derive a more efficient use of chlorine, which is used to reduce both odors and corrosion. These models could then predict wastewater characteristics, volatile fatty acids (VFA), and hydrogen sulfide levels to predict and minimize the chlorine dosage that curtails odors and corrosion.

Based on improved data analytics and predictive models, they estimate a potential chlorine savings of approximate 87 percent or 28,000 gallons per year. Furthermore, infrastructure corrosion will be minimized to extend the useful life of facilities and equipment. These models will also allow staff to operate an enhanced biological phosphorus removal (EBPR) process in a more efficient manner using forecasted VFA and other influent characteristics parameters. Staff believe the machine learning can be applied using existing sensors and operational data to assist plant operations engineers and management to solve treatment process problems faced by many water resource recovery facilities.

“We are proud to have our faculty and students contribute to such impactful, applied research. The best research

efforts spark new knowledge and contribute to improvements in the professional community. This project is poised to do both,” said Dr. Traci Carte, director of the Illinois State University School of Information Technology.

The Intelligent Water Systems Challenge, which kicked off in February, made general problem statements and example datasets available to participants. Scenarios focused on collection systems, wastewater treatment systems, drinking water treatment systems, source water/watershed, and distribution networks. But only the most innovative solutions were asked to present findings at WEFTEC.

“We congratulate our staff and partners at ISU for thinking outside the plant to create a new intelligent water system that will provide instant savings for our treatment facilities,” said MWRD Commissioner Frank Avila. “We hope this research will help us shed light on the many environmental challenges that face our treatment operations that are demanded to clean an average of 1.3 billion gallons of water per day.”

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### *Recovering Resources, Transforming Water*

*Established in 1889, the MWRD ([www.mwr.org](http://www.mwr.org)) is an award winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.*