Super saver

Student's research prevents pollution, reduces freshwater use

By Taylor Provine

Isaac Wright, recent graduate in biological systems engineering, has studied methods to save freshwater and reuse wastewater disposal from industrial processes.

You could say Isaac Wright's research is making a splash.

Wright, a spring 2020 graduate in biological systems engineering in the Kansas State University Carl R. Ice College of Engineering, has studied methods to save freshwater and reuse wastewater disposal from industrial processes.

"I study ways to take water that's not good enough for drinking and use it in other ways," he said. "Any water that remains in the cycle is useful."

As an undergraduate, Wright participated in the Pollution Prevention, or P2, Intern Program offered through the K-State Pollution Prevention Institute. Through the 11-week program, interns are trained and placed at a host company with specific pollution prevention projects. The interns perform a case study and calculate project recommendations, environmental outcomes and cost.

Wright interned at Compass Minerals at one of its salt mining plants in central Kansas. The company has a corporate goal to reduce freshwater use across all of its sites nationally and internationally, he said.

One of Wright's projects reviewed two continuous flow drinking fountains that ran 24/7 year-round, he said.

"My research showed installing two traditional hi-low drinking fountains would save 1.7 million potential gallons of water and $4,600 per year, depending on exact water consumption and electricity use," Wright said. "Based on my recommendations, they installed these new water fountains at the site."

He also studied diversion options for the company's wastewater.

"The salt mining process contributes to wastewater because the high saline water can't be used for irrigation, so it is immediately pumped into an underground water deposit," Wright said.

Wright's recommendations included diverting wastewater to an area golf course for use on fairways or using it for wetland creation or restoration. While these options could be implemented in the future, Wright said more research and policy changes are needed.

Wright said freshwater reduction and wastewater reuse research is important because it can address water problems in other areas.

"In central Kansas, water is readily available, but if you go 100 miles west, they are struggling to bring in the water that they need," he said. "You have to start in the areas that don't have the problem and have the best management practices in place so that the problem doesn't continue."

Wright has presented his research at the Governor's Water Conference and the Kansas Environmental Conference, which is the state's premier environmental conference hosted by the Kansas Department of Health and Environment.

"We enjoy working with the K-State Pollution Prevention Institute and appreciate the contributions that the interns have made at our facility over the last several years," said Brent Peterson, Compass Minerals project engineer. "Isaac's work made an immediate positive impact on water use at the plant and further developed our long-term plans for continuously improving the way we manage water." k

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