



Currents

November 2018

Looking Forward to the Governor’s Water Conference & Research Symposium

(by Dr. Kevin Wagner)

The Oklahoma Water Resources Center and Oklahoma Water Resources Board are excited to invite you to this year’s Oklahoma Governor’s Water Conference & Research Symposium, scheduled for December 5-6, 2018 at the Reed Conference Center in Midwest City.

As always, we have a great program focused on the state’s key water issues and cutting edge research! This year’s Research Symposium will complement the Water Conference, providing current research on drought monitoring and management, soil moisture monitoring, irrigation management, groundwater availability, and water use and management. Please join us! Also, make sure to stop in and see the 33 posters (29 students) covering a wide range of water resource management topics. Learn more about the topics to be presented on our [2018 Symposium page](#).

We are also excited to announce **Chad Pregracke will be our luncheon speaker** on December 6th. Chad is the 2013 CNN Hero of the Year and President/Founder of Living Lands & Waters (LL&W). Growing up and working on the Mississippi River, he became appalled by the amount of garbage in the river and decided that if no one else was going to do something about it, he would. I hope you can join us to learn and be inspired by Chad’s amazing story!

See you there!



Chad Pregracke’s life’s work has been removing trash from the Mississippi River. (Photo: Tim A. Parker/File/USA Today)

Produced Water: Importance of Treatment and Reuse (by Brittany Davis)

Oklahoma produced about 153 million barrels of crude oil and 2,468 billion cubic feet of natural gas in 2016.1 Along with this oil and gas, about 755 million barrels (1 barrel=42 gallons) of water were produced throughout the state!2

This water, most commonly called “produced water,” is the water naturally present in oil- and gas-bearing geologic formations combined with any flowback of water pumped into the ground in order to fracture or flood the rock containing oil and gas. Unfortunately, when this water surfaces, it contains pollutants making it unsafe for use without major treatment.

Oklahoma’s produced water is either reused in the oil field or disposed of through reinjection, meaning it is pumped back into the ground. This disposal process has been linked to an increase in seismic activity.3 Reinjection of flowback water also removes water from the natural water cycle. Concerns of increasing earthquakes and increasing water needs are compelling professionals around the world to develop effective treatment methods.

Researchers, including several at Oklahoma State University, are exploring treatment options, including membrane filtration, reverse osmosis, thermal distillation, and evaporation. Unfortunately, **none of these treatment methods is able to single-handedly treat the various impurities in produced water**, which may include salts, hydrocarbons, toxic metals, and even radioactive compounds.

While it is important to treat for all of these impurities, salts are the biggest challenge.5 Produced water can be 1-30% salt by weight (compare that to seawater at 0.3%)!6 At such high salinity levels, standard wastewater treatment methods cannot be used.7 Existing methods of desalination, the process of removing salt from the water, are very costly and require a lot of energy. Current research is pursuing a solution to this matter.



A produced water storage tank

...[Read the full article](#) to learn how OSU faculty are working to solve this ever-growing concern.

Opportunities

Funding

- **BoR:** Desalination and Water Purification Research Program (due 12/13/18)
- **USDA RUS:** Solid Waste Management Grant (SWM) Program (due 12/31/18)

[\[more info\]](#)

Employment

- Assistant Professor of Hydrogeochemistry/Low Temperature Geochemistry (OSU)
- Hydrologic Scientist, Oklahoma Water Survey

[\[more info\]](#)

Events

- **Oklahoma Governor's Water Conference and Research Symposium** (Midwest City, 12/5-6.)
- **Water Research Advisory Board Meeting** (Stillwater, 12/13)
- OCLWA Annual Conference (Stillwater, 4/3-4)

[\[more info\]](#)

How Efficient Are Irrigation Systems in Oklahoma? (by Drs. Abu Mansaray & Scott Frazier)



An Oklahoma producer and Dr. Scott Frazier assess an irrigation pump used to produce a crop in the Oklahoma Panhandle (left to right)

A team of researchers recently measured energy and water delivery efficiencies of agricultural irrigation systems in western Oklahoma. Drs. Scott Frazier, Saleh Taghvaeian, and Jason Warren at Oklahoma State University made up this team with Dr. Frazier leading the energy portion of the project.

He found from testing 32 irrigation systems that most pumps in this area were less energy efficient than recommended standards. Assuming similar trends for the 4,800 irrigation pumps across the state, **irrigators could save almost \$7 million each year**, if a few simple steps were taken to improve the energy efficiency of their pumps. Recommended actions include ensuring pumps are properly sized, reducing irrigation system pressures, monitoring the fuel or electric power use efficiency of their pumps, and scheduling irrigation applications based on crop needs.

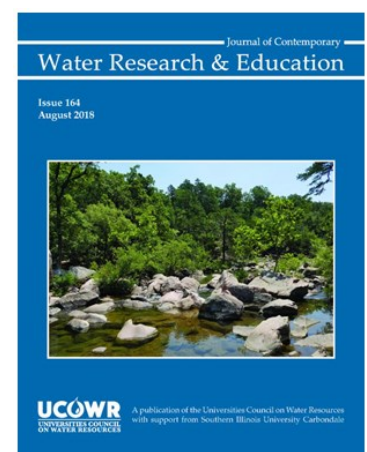
This project was funded through the Water Center's Oklahoma Water Research Grants Program. For more information about Dr. Scott Frazier, this project, or its funding source, please visit <http://water.okstate.edu/connect/faculty-members/frazier>. There you will also find Extension fact sheets on groundwater irrigation testing and issues.

New Resources



Septic System Maintenance Project

Dr. Sergio Abit demonstrates the process for septic system maintenance to find issues before they become big problems.



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