

# THE AQUAHOMAN

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The newsletter of the

**OKLAHOMA  
WATER RESOURCES CENTER**

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Oklahoma Water  
Resources Center

## From the Director's Desk (by Kevin Wagner)

It's great to be back in Oklahoma and have the opportunity to lead the Oklahoma Water Resources Center.

I received my Master's Degree from Oklahoma State University and spent the early years of my career here working for the Oklahoma Conservation Commission and USDA-Natural Resources Conservation Service. In that time, I had the opportunity to work across the state from Lake Eucha in the east to Lake Skipout in the west and a dozen other watersheds in between, conducting watershed studies and developing strategies to improve water quality through voluntary land stewardship.

Since leaving Oklahoma, I have been involved in water conservation and water quality improvement efforts in Texas, leading conservation programs at the Texas State Soil and Water Conservation Board and for the last 12 years, administering watershed assessment and planning, BMP evaluation, agricultural and urban water conservation research, education

and outreach, and other efforts at the Texas Water Resources Institute at Texas A&M University.

My goal is to help bring interdisciplinary and multi-institutional research to the forefront of the Water Center's efforts to help solve Oklahoma's complex water resources issues. The Water Resources Research Act of 1964 established water resources research institutes in each state (typically at the land grant universities) to:

- Plan, facilitate, and conduct research to aid in the resolution of State and regional water problems
- Promote technology transfer and the dissemination and application of research results
- Provide for the training of scientists and engineers through their participation in research
- Provide for competitive grants to be awarded under the Water Resources Research Act

When President Lyndon B. Johnson signed the act into law he stated, "Abundant, good water is essential to



Dr. Kevin Wagner

continued economic growth and progress."

Improving water quality, advancing water conservation, and expanding water education programs will be high priorities for the Water Center along with beneficial use of produced water to support future economic and population growth in Oklahoma and beyond, agricultural sustainability, and optimizing food-energy-water systems.

I genuinely look forward to meeting and working with you in the coming days and years to ensure "abundant, good water" essential to our state's future.

## The U.S. Geological Survey Oklahoma Water Science Center (by Bill Andrews, Director, U.S.G.S. Oklahoma Water Science Center)

### Introducing the People and Organizations Composing Our Water Research Advisory Board

The U.S. Geological Survey (USGS) is the principal natural science research and information agency of the Federal government. The USGS is organized into seven mission areas: Climate and Land Use Change, Core Science Systems, Ecosystems, Energy and Minerals, Environmental Health, Natural Hazards, and Water.

The USGS Oklahoma Water Science Center (OK WSC), part of the Water Mission Area, has collected and interpreted data about the distribution, availability, and quality of water in Oklahoma since 1898.

The Center's missions are to collect high-quality hydrologic data and conduct scientifically sound hydrologic investigations. The data that center staff collect and interpretive reports that they publish are used to minimize loss of life and property; manage water and related resources, enhance and protect the quality of life, and contribute to sustainable economic and physical development.

The OK WSC has offices in Oklahoma City, Tulsa, and Woodward, with about 40 employees between those offices. Staff members in those offices include Hydrologists, Hydrologic Technicians, and supervisory and support personnel.

Center staff operate a network of 193 streamflow-gaging stations, 26 lake-level monitoring stations, 26 continuous water-quality monitoring stations, and 58 groundwater-level monitoring stations in Oklahoma. Data from those continuous monitoring stations can be accessed 24 hours per day via links on the Data Center section of the Center's webpage at <http://ok.water.usgs.gov>.

In addition to collecting continuous hydrologic data, Center staff periodically collect water-quality samples for analysis of a wide range of chemical and microbiological constituents, including organic compounds known as "emerging contaminants". Those water quality data also can be downloaded from the Center's web page.

Data collected by Hydrologic Technicians and Hydrologists of the Center, in addition to being widely available to the public, are used to prepare interpretive reports about water resources. Topics of reports recently published by Center staff have included:

1. reevaluation of peak streamflows in the Oklahoma Panhandle to help guide infrastructure design,
2. simulations of regional aquifer systems to help the State and others manage and use water resources,
3. evaluation of effects of land-use changes on streamflows in the Cimarron River Basin,

4. analysis of the effects of dam breaches and extent of flood inundation that could be caused by such breaches for several Oklahoma cities, and

5. assessment of groundwater and surface-water quality in several Tribal Jurisdictional Areas of Oklahoma.

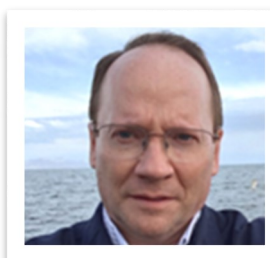


**USGS Hydrologic Technician measuring streamflow during a flood on the Illinois River.**

Center staff attend and make presentations at numerous technical and public meetings and conferences each year. Center staff also conduct free hydrologic training classes for staffs of Native American Tribes in Oklahoma and surrounding states. The Center's work funded in part by USGS appropriated funding and in part by reimbursable funding from almost 50 other Federal, State, Tribal, and local government agencies.

OK WSC staff regularly collaborate with subject-matter experts from other USGS offices, other agencies, and universities on a range of projects including regional aquifer assessments, rainfall-runoff relations, aquatic ecology, and ecological streamflows to bring the best multidisciplinary water science possible to evaluate Oklahoma's water resources and trends in those resources.

Bill Andrews has been the Director of the center since 2014. He grew up in Virginia, has worked with the USGS since 1988, and has lived in Oklahoma since 1997. In addition to his interests in water resources, he spends part of his spare time researching genealogy and American and European history and is a member and officer of several historical organizations.



**Bill Andrews at the Great Salt Lake**

## Oklahoma Governor's Water Conference and Research Symposium

THIRTY-EIGHTH ANNUAL OKLAHOMA GOVERNOR'S WATER CONFERENCE AND RESEARCH SYMPOSIUM

**THE VALUE OF WATER INVESTMENT IN OKLAHOMA**  
OCT 31-NOV 1, 2017  
EMBASSY SUITES, NORMAN

**LIQUID ASSETS**

### Latest News:

- ◇ Seth Siegel, author of *Let There Be Water: Israel's Solution for a Water-Starved World*, will speak on 10/31.
- ◇ Dr. Todd Halihan, Professor of Hydrogeophysics at Oklahoma State University, will speak on 11/1.
- ◇ A draft agenda is posted online.

The Oklahoma Governor's Water Conference and Research Symposium is a partnership between the Oklahoma Water Resources Board and the Oklahoma Water Resources Center.

The 2017 meeting will be held at Norman's Embassy Suites Hotel & Conference Center Oct 31-Nov 1.

Visit <http://water.okstate.edu/activities/symposium> for all the links you need to be a part of this year's event, including:

- 💧 Online registration (\$200 for professionals (**early-bird ends 9/15**); \$45/day for students)
- 💧 Reduced room rates at the Embassy Suites
- 💧 Abstract submission form (the call **closes on 9/18** at noon)
- 💧 Guidelines for oral presentations
- 💧 Guidelines for poster presentations



## 2017 Oklahoma Onsite Wastewater Conference

December 19, 2017  
Wes Watkins Conference Center,  
Stillwater, OK; 8:00 AM to 3:30 PM



*Theme: On-site Wastewater System: From Design to Maintenance*

## Faculty Spotlight: Todd Halihan

(by Todd Halihan, Professor of Geology, Oklahoma State University)



**Dr. Halihan conducting fieldwork with his students at the Washita River near Cheyenne, OK. Behind Dr. Halihan are (left to right) Kyle Spears, Sean Hussey, Clay Fitzgerald, Spencer Harris, and Roslyn Bailey.**



Today's Final Jeopardy category is "Geologists."

*A professional driller (OK), a professional geophysicist (CA), and a professor of geology; he has provided input to stories on CBS, Fox News, NPR, CNBC, Popular Science, the New Yorker, and the New York Times.*

The question is: "Who is OSU's Todd Halihan?"

That's me, and I am glad to have this opportunity to introduce myself. Currently a professor of geology in the Boone Pickens School of Geology, I have been able to serve as associate editor for *Ground Water*, secretary-treasurer of the U.S. Chapter of the International Association of Hydrogeologists, and chair of the hydrogeology division and the South-Central Section of the Geological Society of America. Over the years, I've been lucky enough to collect a few awards: the Karin and Robert J. Sternberg Award for Excellence, Partners in Conservation Award from the U.S. Department of Interior, and the Sterling L. Burks Award for environmental research; additionally, I'm a fellow of The Geological Society of America.

My professional interests center on subsurface characterization and sustainable water supply. I have worked on over 200 different research and commercial sites in over 30 U.S. states and overseas. In Oklahoma, I spend a significant amount of time evaluating the Arbuckle Group of carbonates and associated groundwater. My international research work has occurred in Australia, Bahamas, Brazil, South Africa, Mexico, and a number of other countries on a commercial basis.

As the Chief Technical Officer for a hydrogeophysics firm, Aestus, LLC, I am able to help commercialize my research to effectively answer questions about the state's and U.S. resources; I serve on the Oklahoma governor's Coordinating Council on Seismic Activity; and, starting in January, I will be the 2018 National Ground Water Association's McElhiney traveling lecturer.

I am looking forward to this new role since I love to travel; however, when I do find myself at home, I enjoy cooking and home improvement.

We are excited to announce that Dr. Todd Halihan will be the invited speaker at this year's Oklahoma Governor's Water Conference & Research Symposium during the November 1st luncheon!



## Unique Water and Energy Audit Helping Producers become More Efficient (by Leilana McKindra, Communications Specialist, Agricultural Communications Services)

Oklahoma producer Merlin Schantz is interested in conserving water and energy as well as being a good steward of the land and resources. That's one reason he – and certainly other producers – have agreed to participate in a unique program that looks at both the water and energy consumption related to irrigation.

"I saw this as a good opportunity to get some comparisons between the systems I had to discern what methods were most efficient," said Schantz, whose operation is based near Hydro.

The opportunity the longtime producer is referring to is the Western Oklahoma Irrigation Water and Energy Audits.

As part of the audit program, OSU researchers Saleh Taghvaeian and Scott Frazier along with graduate students analyze growers' energy and water consumption during irrigation.

"If producers want to reduce their energy costs, there are two ways to do it," said Taghvaeian, OSU Cooperative Extension water resources specialist. "They can get more efficient with their energy use with their engines and motors. The other way is to get more efficient with irrigation. The less water you use, the less energy you use for pumping that water."

Since debuting the effort about three years ago, they have worked with some 20 producers to complete audits on 26 systems throughout the Panhandle and western Oklahoma.

"It's a no-cost program and it's through a university so they trust us," Taghvaeian said. "We go to some really remote areas and we show them how many dollars they save. To me, **it's having a really positive impact on rural Oklahoma.**"

After the audit, the producer gets a comprehensive report that includes data such as usage; well depth ; potential monetary, energy and water savings; and a slate of helpful recommendations.

"We thought it'd be kind of unique to combine energy efficiency with water efficiency," Frazier said. "The difference between our program and what most other states do is they look at the energy part of it. This has got Dr. Taghvaeian doing the irrigation efficiency and we combine that with the energy. In other cases, it's either one or the other, it seems, but this actually puts it together and reports three things, including the sustainability."

At first, Taghvaeian and Frazier viewed the audits as an avenue to generating important research while helping producers enhance their bottom lines. But, as word has spread

about the program, it has attracted growing interest as the researchers are now fielding calls from the Natural Resources Conservation Service and neighboring states. Not to mention the energy cost savings possibilities keep the door open for strong ongoing producer interest, which then leads to introduction of water savings opportunities.

After using seed grants from the OSU Division of Agricultural Sciences and Natural Resources as well as the U.S. Geological Survey through the [Oklahoma Water Resources Center](#) to launch the project, the program also recently earned a \$20,000 gift from Tulsa-based utility Public Service Company of Oklahoma to further the research.

Even as audits are ongoing, Taghvaeian and Frazier have begun looking ahead. One of the next steps for the project is to begin exploring how irrigation systems behave over time and in near real time.

"These audits are snap shots, which are giving us good information. The next step is to see how these systems behave day-to-day," Frazier said. "We're also trying to get a handle on sustainability. In other words, if you flood a field by over-applicating, what happens then? What's the impact to local air, land, water and groundwater? What's the impact of doing this correctly or incorrectly?"

"In Oklahoma, more than a third of our total fresh water use is for irrigated agriculture. If we are more efficient with it and can conserve more of it, that helps everyone, not only folks who use it for irrigation purposes," he said. "Energy is the same way. If I'm a big energy user and it's a hot July day and I need to turn on my pump to water my crops, it comes at the cost of someone else who needs their air conditioning or something else. We're all in this together."

This article has been edited. Read the full news story at <http://www.dasnr.okstate.edu/news/premier-news/unique-water-and-energy-audit-helping-producers-become-more-efficient>.



# New & Noteworthy

## Funding (<http://water.okstate.edu/researchers/funding>)

- US Fish and Wildlife Service: Partners for Fish and Wildlife (due 9/30/17)
- NSF: Chemical Synthesis (due 10/2/17)
- NSF/NSFC Joint Research on Environmental Sustainability Challenges (due 10/20/17)
- NSF: Paleo Perspectives on Climate Change (due 10/20/17)
- NSF: INFEWS (due 10/20/17)
- USFWS: NAWCA FY18 Small Grants Program (10/19/17)
- NSF/USDA/NIH: Ecology and Evolution of Infectious Diseases (EEID; due 11/15/17)

## Events ([water.okstate.edu](http://water.okstate.edu))

- 2017 Sustainability Conference (Oka' Institute, East Central University; 10/10-11)
- Oklahoma Governor's Water Conference & Research Symposium (Norman; 10/31-11/1)
- Oklahoma Grows Conference + Trade Show (Thackerville; 11/8-9)
- Oklahoma Onsite Wastewater Conference (Stillwater; 12/19)
- Oklahoma Natural Resources Conference (Tulsa; 2/21-23)

## Web Updates ([water.okstate.edu/updates](http://water.okstate.edu/updates))

- Our 2016 Annual Report is now available.
- Check out our new video playlists: *Soil Moisture* and *Septic Systems*.
- What's that new menu item? It's FAQs! Topics include water testing, pond issues, permitting, and more.
- *Produced Water Challenges* presentation: Dr. David Lampert covers four aspects of *Emerging Challenges in Produced Water Management*.

## Connect



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