

THE AQUAHOMAN

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The newsletter of the

**OKLAHOMA
WATER RESOURCES CENTER**

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DIRECTOR:
Garey Fox

**PROGRAM COORDINATOR
& EDITOR:**
Leslie Elmore



Oklahoma Water
Resources Center

From the Director's Desk (by Garey Fox)

What a pleasantly unusual summer it's been! Most of the state has benefitted from an unexpected wealth of rainfall. As of late, most of the reservoirs in the state were above 90% capacity with Lake Lugert-Altus at 60%. Eastern Oklahoma lakes were over 100% of normal pool storage.

We even experienced the wet weather first hand at our latest Water Research Advisory Board (WRAB) meeting held at the Port of Catoosa and hosted by Deidre Smith with the Oklahoma Department of Transportation. The outstanding tour of the Port was delayed slightly due to *heavy* rain and winds, but we completed a very successful meeting with updates from the 2015 projects on climate and land use impacts on water levels in Lake Lugert-Altus, irrigation and water use efficiency research with water from the Ogallala Aquifer, and quantifying and predicting streambank phosphorus loads in the Illinois River Watershed. You can learn more about these projects [on our website](#), which includes project

reports from all funded projects by the Water Center. I am extremely proud of the quality of research that the WRAB has selected and the Water Center has supported through our USGS 104b base funding.

Our USGS base funding continues to lead to larger and even more impactful projects. For example, Dr. Jason Warren in OSU's Department of Plant and Soil Sciences, is a member of a research team just awarded a USDA project worth \$10 million to study irrigation in the Ogallala. The project led by Colorado State University builds upon much of the work that the Water Center has supported over the last several years by Dr. Warren's research team. You can learn more about his grant on www.agweb.com.

I would also like to invite you to hear about these projects and others being conducted across Oklahoma by attending the upcoming [2016 Governor's Water Conference and Research Symposium](#) on October 11-12th in Norman, OK. Our invited speaker will be Conrad Weaver, an EMMY



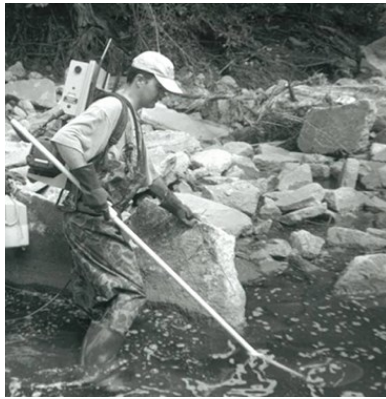
**Dr. Garey Fox on the Tulsa
Port of Catoosa tour trolley**

Award-Winning Film Maker, who just finished a new documentary called "Thirsty Land". Several Oklahoma State University researchers visited with Conrad about the impact of drought on water resources in Oklahoma, and while the movie is heavily focused on California water issues, many of the impacts and lessons learned are directly applicable to Oklahoma. As part of the keynote address, the movie will be screened at the meeting, so please make plans to join us for this exciting event.

Oklahoma Water Resources Board

(by J.D. Strong, Executive Director, Oklahoma Water Resources Board)

My first experience helping manage Oklahoma's water resources was like many other aspiring hydrologists and environmental scientists in the state: I began as part-time staff in the [Oklahoma Water Resources Board's](#) (OWRB) Water Quality Division collecting water data across the state. During my time as a budding water scientist, I had no idea of the true breadth of the OWRB's role in managing, protecting, and improving Oklahoma's water resources. I also didn't fully grasp that my efforts were merely the first step, albeit a very important one, in the process of ensuring that Oklahoma's water resource management decisions are founded on sound scientific data and analysis. As I've continued my 23-year career with Oklahoma's natural resource agencies, and now as the OWRB's Executive Director, I'm most proud that our biggest and most important initiatives were established on a firm foundation of science.



J.D. Strong conducting Use Attainability Analyses for the OWRB's Water Quality Standards program in 1994.

The OWRB accomplishments of which I am most proud include finalization of the [Oklahoma Comprehensive Water Plan](#), a 50-year water supply assessment and policy strategy to meet Oklahoma's future water needs; the [Water for 2060](#) Final Report, containing recommendations to meet the goal of using no more fresh water in 2060 than was used in 2010; and the recently announced historic tribal water rights settlement between the State of Oklahoma, City of Oklahoma City, and the Choctaw and Chickasaw Nations.



The 2012 Update of the Oklahoma Comprehensive Water Plan (OCWP) was a 5-year intensive and multi-faceted analysis of Oklahoma's water resources that culminated in a 50-year water supply assessment and policy strategy to meet Oklahoma's future water needs. Improving upon previous state water plans, this OCWP is a robust compilation of technical data, regionally-focused planning reports, and stakeholder-generated policy priorities; in fact, all the initiatives that follow are embodied in the eight Priority Recommendations that form the central core of the OCWP.

Achieving the ambitious goal of the Water for 2060 Act while protecting Oklahoma's future growth and prosperity will require careful planning and thoughtful solutions, including expanded conservation efforts, greater public outreach and education programs, and promoting industrial and agricultural innovations in water use efficiency. At every step, our efforts will be guided by strong scientific analysis and comprehensive stakeholder input, including recent advances in aquifer storage and recovery (ASR) and potable/non-potable reuse.

Finally, the recently announced tribal water rights agreement is not only historic in that it resolves decades of conflict, but also is unprecedented in its scientific underpinnings. Without exaggeration, we assembled the best and brightest water experts to craft the most sustainable solutions for long-term water management in southeast Oklahoma. I'm proud to have been part of the process and to witness the recognition of OWRB's technical prowess.

As the demand for and uses of Oklahoma's treasured water resources have grown and changed throughout the years, so too has the OWRB's service to Oklahomans. When the OWRB was created in 1957, the agency's mission was largely centered on the administration of water rights. In the decades since, the OWRB has financed over two-thirds of the water and wastewater infrastructure throughout the state, developed a robust water quality and quantity monitoring network, built nationally renowned dam safety and floodplain management programs, created water well driller licensing and enforcement programs, and amassed an impressive suite of hydrologic studies and technical tools to more sustainably manage Oklahoma's most precious natural resource.

What a journey it has been, both for the OWRB's nearly 60-years of existence and for my 23-year ride along the way! Our brilliant and devoted public servants, as well as those who came before us, helped drive change and evolve the agency to tackle the water management challenges of our young state's second century. With a strong devotion to scientific excellence lighting the way, we look forward to an even brighter water future for all Oklahomans.



J.D. Strong

DASNR selects 2016 Distinguished Alumni and Champions

(by Sean Hubbard, Communications Specialist, Agricultural Communications Services)

The Division of Agricultural Sciences and Natural Resources at Oklahoma State University has a rich tradition and history of improving the quality of life for all Oklahomans through conducting and disseminating science-based research. This is not possible without the achievements and excellence of its alumni, as well as other leaders around the world who are not alums of the college, but contribute to its mission. To acknowledge some of these outstanding alumni and friends of the university, DASNR recently selected its Distinguished Alumni and DASNR Champion award winners.

Recognized as 2016 Distinguished Alumni of the College of Agricultural Sciences and Natural Resources are Larry Ferguson, Sen. Ron Justice and Matthew Waits. The 2016 DASNR Champions are Randy Byford, **Dick Fischer and Malinda Berry Fischer** and Helen Hodges.

Ferguson earned his bachelor's degree in animal science from OSU in 1975. Upon graduation, he began his career as a production supervisor with Schreiber Foods, the world's largest employee-owned dairy company. In 1999, Ferguson became president and CEO of the company before retiring in 2007. In 2014, on behalf of the Ferguson Family Foundation, he provided funding to upgrade the OSU Dairy Center.

Justice received both his bachelor's and master's degrees from OSU in agricultural education in 1967 and 1968, respectively. Upon graduation, he became the OSU Cooperative Extension educator for Grady County until he retired in 2003. In retirement, Justice ran for office and served as an Oklahoma senator and is retiring from public service this year.

Waits earned a bachelor's degree from OSU in agricultural economics in 1999. After graduation he was appointed director of the Information Lab program for SST Software, an industry leader in agricultural information management. In 2012, Waits was named CEO of SST, which manages site-specific data for approximately 100 million acres spanning 23 countries. Owner of Byford Auto Group in Oklahoma City, Chickasha and Duncan, Byford has been a strong supporter of OSU since purchasing his first dealership in 2005. He has supported DASNR, OSU, the Spears School of Business, the College of Arts and Sciences and the Athletics Department. Byford received the Distinguished Service Award from OSU's Department of Animal Science and is a Lifetime Member of the OSU Alumni Association.

Malinda Berry Fischer's grandmother was the second woman to graduate from Oklahoma A&M College in 1898. Following in those footsteps, in 1960, she also graduated from OSU with a degree in secondary education before earning a degree from Harvard-Radcliffe Program in Business Administration in 1962.



Malinda Berry Fischer and Dick Fischer

Dick Fischer, 1959 and 1963 graduate of Harvard College and Harvard Law School, was an adjunct professor in the OSU School of Business for six years after a 30 career with the law firm of Nixon, Hargrave, Devans and Doyle in Rochester, New York.

Through matching investments from T. Boone Pickens, **the Fischer family gifted \$1 million in endowed funds toward the Thomas E. Berry Professorship in Water Research and Management in honor of her father.** A former interim president and CEO of the OSU Foundation, Berry Fischer previously served as the president of Marietta Royalty Company and chairperson of Thomas N. Berry and Company.

A 1979 OSU accounting graduate, Hodges continued her education at the University of Oklahoma to obtain her law degree in 1983. During and after a successful career in law, Hodges has continued to support OSU and was a 2014 OSU Medallion recipient for the Dillon and Lois Hodges Professorship in Plant and Soil Sciences, in honor of her parents. Since its inception, the professorship has directly strengthened the Oklahoma Wheat Improvement Team.

(excerpted from original article, which is posted on water.okstate.edu.)

Student Mentoring at the Governors Water Conference and Research Symposium: A Success Story

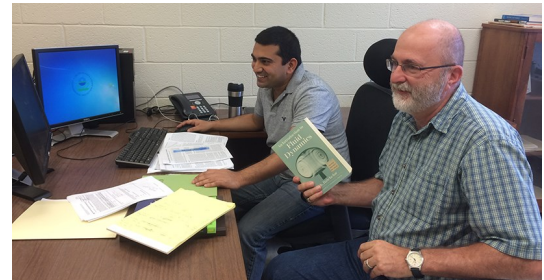
(by Dr. Anish Khanal, Oak Ridge Institute for Science and Education research participant for USEPA)

As competition for research careers increase, student are looking for more opportunities to network and make connections with potential employers. This can be awkward and confusing without an existing connection.

I consider myself one of the few fortunate individuals who has been provided such an opportunity and I have the Governor's Water Conference and Research Symposium to thank. This annual event is co-hosted by the [Oklahoma Water Resources Board](#) and the [Oklahoma Water Resources Center](#). In December 2015 I attended this event to present my research as a Ph.D. candidate at Oklahoma State University (OSU).

Water Center staff organized a student mentoring program during the event in which participating students were seated with mentors during lunch. Mentors included scientists and administrators attending the symposium in various capacities.

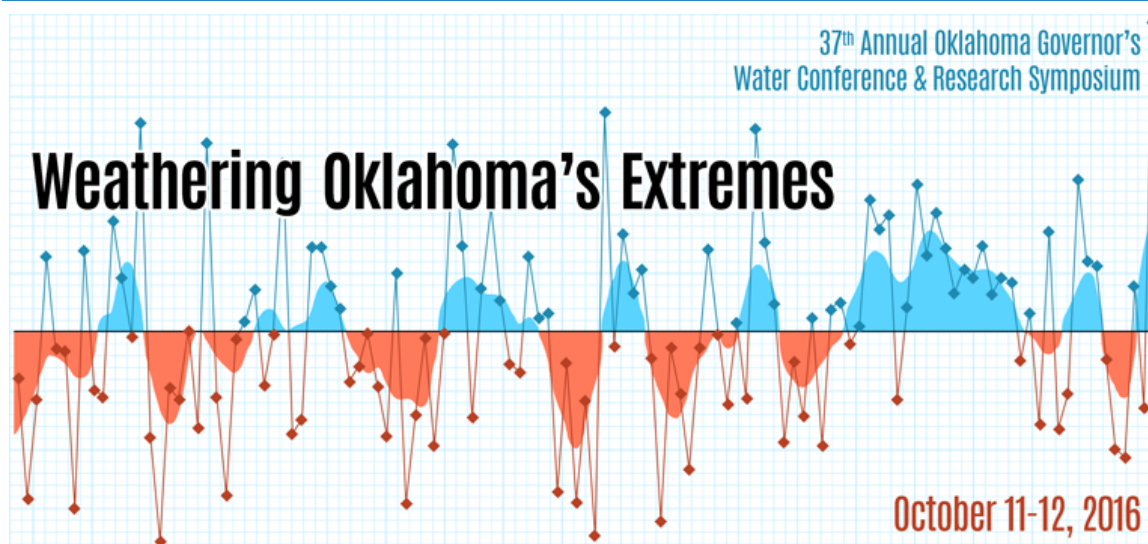
I was fortunate to be seated with Dr. James W. Weaver, a prominent scientist working for the Robert S. Kerr Environmental Research Center (RSKERC) in Ada, OK. We struck up a conversation about each other's research and areas of academic interest, and later exchanged contact information. I left a copy of my resume with Dr. Weaver.



Dr. Anish Khanal and Dr. James Weaver at work.

To my great delight and surprise, I received an email from him few weeks later in which he encouraged me to apply for a post-doctoral research participation program being offered at the United States Environmental Protection Agency. I applied for the program and scored an interview! A few weeks later I received the offer letter for position at the RSKERC in Ada, OK. Currently Dr. Weaver and I are working together to develop a model to predict the risk and extent of onshore crude oil spills.

I am grateful to the Water Center staff for organizing the program and to the faculty in the biosystems and agricultural engineering department at OSU, who expect students to attend events such as the Governor's Water Conference and Research Symposium to present their work to a wider audience and connect with the leading scientific community. Such experiences provide students much needed networking opportunities and are essential to building successful careers.



The 2016 Governor's Water Conference and Research Symposium will be held in Norman October 11-12, 2016.

Get the most current information on [our site](#) or by [joining our mailing list](#).

Online early-bird registration is now available at <https://www.owrb.ok.gov/apps/GWC>.

STUDENT SECTION:

Student Listserv

Sign up for our *Student News* listserv and stay informed about opportunities coming through the Water Center.

<http://water.okstate.edu/join-mailing-list>

STUDENT AFFILIATE PROGRAM

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We are excited to invite OSU students to apply for the Student Affiliate (StAff) Program.

StAff will partner with the Center to promote its activities and generate products while highlighting their talents and growing their resumes.

Sign up by 9/9 at [water.okstate.edu/students/staff](http://water.okstate.edu/students/staff)



# Did you catch the story on page 4?

It's happening again this year! Not only will student presenters in the Water Research Symposium be automatically entered into the Student Poster Contest with **cash prizes**, but you'll have lunch with a professional on presentation day.

So, don't forget to update and bring your resume!

And who knows? This **Career Conversation** could be the start of your career.

## NSF REU Students Learn about Oklahoma and its Water Resources (by Dr. Garey Fox, Oklahoma Water Resources Center director and NSF-REU advisor)

Undergraduate research can make a significant impact on the future professional careers of college students, keeping them engaged in Science, Technology, Engineering, and Mathematics (STEM). Part of the mission of the Oklahoma Water Resources Center is to foster educational activities related to water in Oklahoma. As a means to accomplish this mission, the Water Center once again hosted seven undergraduate students from universities across the United States as part of a National Science Foundation (NSF) funded project called a Research Experience for Undergraduates (REU).



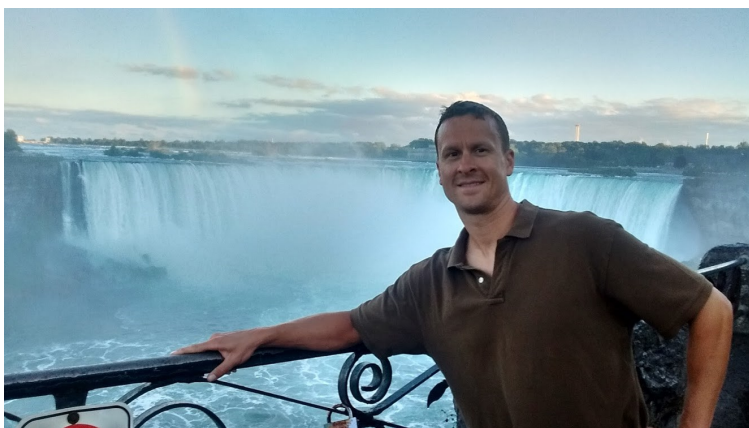
(Pictured l-r: Ashley Kinsey, Alexandra Shipman, Stephanie Estell, Paige Kleindl, Kayla Kassa, Kori Groenveld, Laura Mackey)

The students conducted state-of-the-art research on Oklahoma streams with OSU faculty members. Projects ranged from sampling macroinvertebrates as part of a stream restoration project in Cow Creek to conducting flume tests at the USDA-ARS Hydraulic Engineering Research Laboratory to sampling fish populations in shaded and non-shaded reaches of Oklahoma Ozark streams. The students also engaged with a high school STEM camp hosted by Jones STEM Academy to demonstrate conservation-related research and recruit students to pursue higher education in STEM.

You can learn more about the program [on our website](#) and see their activities and explorations this summer on Twitter by searching #REUStreamTeam.

## Faculty Spotlight: David Lampert

(by David Lampert, Assistant Professor of Civil & Environmental Engineering, Oklahoma State University)



Dr. David Lampert at Niagara Falls

I began my appointment in the School of Civil & Environmental Engineering at OSU in January 2016. I am no stranger to Stillwater, however, having completed my B.S. in Civil Engineering here in 2001. I did my graduate work in the Environmental and Water Resources Engineering Program at the University of Texas at Austin where my research focused primarily on pollution control in aquatic systems. I worked for a few years between my M.S. and Ph.D. degrees as a consulting engineer for both industrial and municipal clients. After graduate school, I spent four years in the Chicago area studying the environmental impacts of energy production at Argonne National Laboratory.

In my current appointment, I am responsible for teaching undergraduate and graduate courses in environmental engineering and building a research program. This semester I am developing a course on global environmental changes where I emphasize the interconnected nature of the Earth's resources and our food, energy, and water systems. In my research, I try to develop quantitative approaches for the analysis of environmental systems at a variety of scales. I love open source computing tools (particularly the Python Language), and I think there is tremendous potential to use new computing techniques to understand and improve the efficiency of our energy and water systems. I hope to collaborate with researchers at OSU and elsewhere to improve environmental quality and the sustainability of our society.

When I have free time, I like to be outside. I am an avid cyclist, triathlete, and golfer. I have traveled more than 30 foreign countries and 44 states, which has given me an appreciation for a wide variety of food and drink. The diverse ethnicities represented on OSU's Stillwater campus encourages unique restaurants and markets to meet the needs of these communities, and we all benefit from them. It's exciting to see how Stillwater continues to grow and diversify.

Find this and more  
new fact sheets here.

OKLAHOMA COOPERATIVE EXTENSION SERVICE AGEC-1064



## State Question 777: A Proposed Constitutional Amendment

Shannon L. Ferrell  
Associate Professor, Agricultural Law

Larry D. Sanders  
Professor and Economist, Policy and Public Affairs

Oklahoma Cooperative Extension Fact Sheets  
are also available on our website at:  
<http://osufacts.okstate.edu>

## Oklahoma NSF EPSCoR: Building Foundations for Future Development (by Emma Kuster, EPSCoR Program Coordinator)

Oklahoma State University and team members from other Oklahoma institutions are working diligently to address socio-ecological issues throughout the state of Oklahoma, and ultimately nationwide. As we enter into Year 4 of our project, we would like to share some of our major accomplishments.

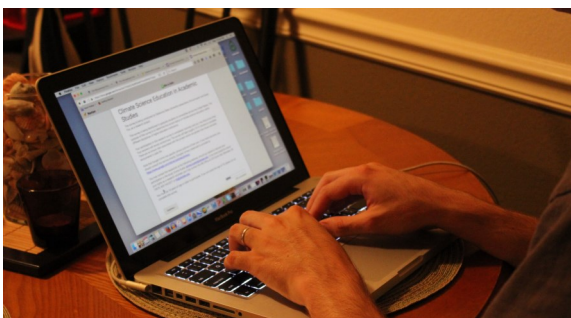
During one of the brainstorming sessions at the National EPSCoR Conference held in November 2015, a few of us began wondering how well graduate students were being equipped to take on the challenges our world will face with climate change. Dr. Garey Fox and I were the primary leads in the developing and implementing a method to assess preparation of this next generation.

We developed and distributed a **web-based survey** to evaluate perception of climate education held by graduate students nationwide. In it, we asked students to rank the following:

1. The level of climate education they received during their studies
2. the importance of climate education in their studies
3. the level at which they considered climate change or climate variability in their ongoing research efforts.

During the spring of 2016, we sent out our survey and received 495 responses from Masters and Doctoral students scattered across the United States. Our findings suggest that:

1. many perceive they are *not* receiving an adequate coverage of the climate system in their programs
2. graduate students believe having climate education in their studies is *highly* important
3. students in agricultural, atmospheric, and engineering sciences *infrequently* consider climate change in their research efforts



Students entered the degree to which climate change education was included in their education and research in this web-based survey.



The latter finding is especially concerning given that these fields are key to sustainable food, water, and infrastructure—all of which are expected to be negatively impacted by a changing climate.

We hope that future research will continue to build upon our study results and answer some of the perplexing questions raised by this study.

Another accomplishment from our project took place on June 15, 2016 when Oklahoma NSF EPSCoR and the Oklahoma Water Resources Center co-hosted the **Kiamichi River Watershed Research and Extension Symposium**. Thirty-five representatives of state and federal agencies/organizations, universities, and tribal nations convened to discuss ongoing research and extension efforts in the area and to outline and prioritize future research and extension needs, including the following crucial needs:

1. In-stream flow determination
2. Surface/groundwater interactions
3. Climate/land-use change impacts
4. K-12 education about the intrinsic value of the Kiamichi River

The symposium attendees now have the information and team members to move forward and begin addressing these needs.

Through this EPSCoR project, we strive to shed light on important issues, such as climate education nationwide and stream temperatures in southeast Oklahoma, and hope that our work will drive further advancements in the socio-ecological realm.

Learn more about the ongoing research through Oklahoma NSF EPSCoR, on our website, [www.okepscor.org](http://www.okepscor.org).

*This material is based on work supported by the National Science Foundation under Grant No. OIA-1301789.*

# New & Noteworthy

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

- USDA: AFRI Climate Variability and Change Challenge Area (due dates: 9/14/16, 11/17/16)
- USBoR Challenge: Preventing Rodent Burrows in Earthen Embankments (due 10/11/16)
- NSF: Environmental Engineering; NSF: Environmental Sustainability (due 10/20/16)
- NSF: Environmental Chemical Sciences (due 10/31/16)

## Employment (<http://water.okstate.edu/job-board>)

- USDA-ARS Postdoctoral Research Associate
- Assistant Professor in Groundwater Hydrology (University of California, Riverside; open thru June 30)

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

- Ground Water Protection Council Annual Forum (Orlando, FL; 9/11-14)
- Osage Creek Stream Restoration Tour (Siloam Springs, AR; 9/14)
- Oklahoma Compost Conference (CHK Central Boathouse; 9/15)
- GIS Tools for Watershed Education (Hinton, OK; 9/23)
- Big 12 Water Conference: Navigating the Food Water Energy Nexus ... (Baylor Univ.; 9/25-28)
- EPA Region 6 Stormwater Conference (Oklahoma City, OK; 10/2-6)
- **2016 Governor's Water Conference and Research Symposium** (Norman; 10/11-12)
- Potable Reuse Summit (Skirvin in OKC; 10/17-18)
- AGI Critical Issues Forum: Lessons from the High Plains Aquifer (Golden, CO; 10/27-28)
- American Water Resources Association (Orlando, FL; 11/13-17)
- Global Horticultural Conference (Stillwater; 11/17)

## Connect



Oklahoma Water Resources Center

Oklahoma Water Resources Center  
Oklahoma State University  
139 Agricultural Hall  
Stillwater, OK 74078  
[water.okstate.edu](http://water.okstate.edu)

E-mail: [water@okstate.edu](mailto:water@okstate.edu)

Phone: 405.744.5615

Fax: 405.744.5339

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