

THE AQUAHOMAN

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The newsletter of the
OKLAHOMA
WATER RESOURCES CENTER

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It's our
50th

DIRECTOR:
Garey Fox

PROGRAM COORDINATOR:
Leslie Elmore



From the Director's Desk (by Garey Fox)

This year is the 50th anniversary of the Oklahoma Water Resources Research Institute (one of the funding arms of the Oklahoma Water Resources Center). We are one of 54 institutes/centers in the U.S. funded through the United States Geological Survey (USGS). The Oklahoma Water Resources Center administers these state-based grant funds, called the USGS 104(b) program.

I had the pleasure of visiting with Senators Inhofe and Lankford, Congressman Cole, and the staffers of our other representatives in Washington D.C. in Febru-



Dr. Garey Fox
with Senator Lankford (above)
and Congressman Cole (below).



Dr. Garey Fox speaks at a ground-breaking ceremony
at the South Central Research Station in Chickasha

ary at the National Institutes for Water Resources annual meeting. It was an honor to describe the importance of the USGS funding for this grants program and the valuable resource that is the Oklahoma Water Resources Center, uniquely positioned to connect stakeholders to experts in water research, extension, and education.

You can verify for yourself the impacts on water resources in Oklahoma from 104(b) grants by reading this issue's grant impact statement by Dr. Justin Moss on [page 3](#) titled "Shaping Oklahoma Water Knowledge through Water Conservation."

If you are interested in applying for funding to research any of a wide range of

water research topics, see the call for pre-proposals on [page 7](#). Researchers from across the state are eligible for these grants.

In Oklahoma we continue to hear more and more about water conservation and reuse – all attempts to use a finite resource in creative ways. The Division of Agricultural Sciences and Natural Resources is at the forefront of water reuse research in the state, breaking ground in April on a water reuse project at the South Central Research Station in Chickasha, whereby treated effluent will be used as a source of irrigation. This facility will lead to research and Extension activities directly aimed at improving our state's resiliency to drought.

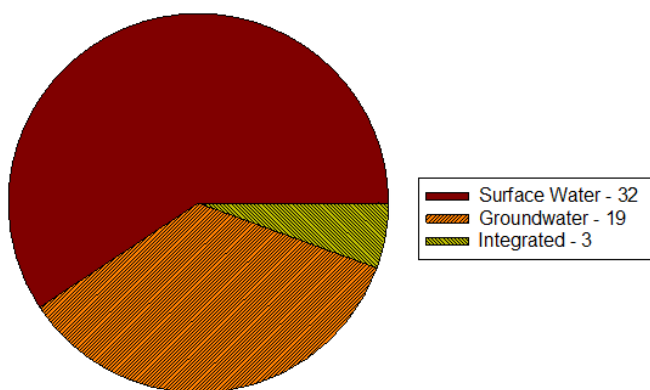
State Grant Review: Analysis of the Past 20 Years of 104(b) Grants

(by Dr. Garey Fox, Oklahoma Water Resources Center Director)

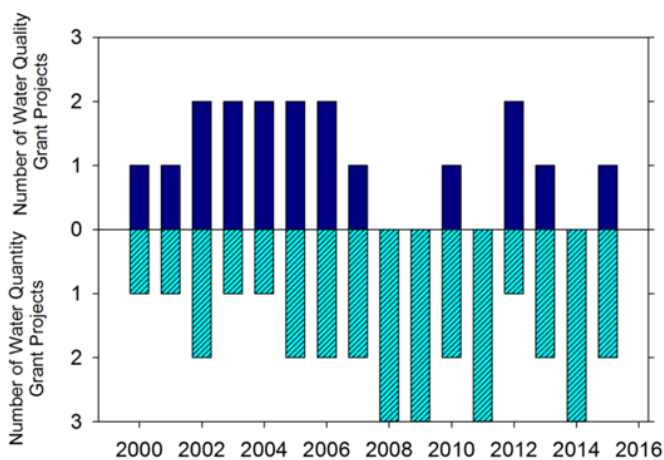
In honor of the 50th anniversary of the Water Resources Institute’s grant program through the USGS 104(b) program (state-based grants), the Water Center recently reviewed project reports from water research conducted in Oklahoma during the past 20 years (1996-2015). This included 54 projects conducted at East Central University, Northeastern State University, Oklahoma State University, University of Oklahoma, and University of Tulsa. Research projects have been sponsored throughout the state of Oklahoma from the panhandle to southeast Oklahoma. Typically three projects are funded at \$25,000 to \$50,000. These grants have a large impact—propelling research programs into significantly larger grant projects and leading to high impact peer-reviewed publications, conference presentations, and invited lectures. You can learn more about the experiences of past researchers on the Water Center’s website: <http://water.okstate.edu/library/impacts>.

As we gear up for the next round of projects, we thought it might be interesting to look back at some of the characteristics of these previous grants.

The majority of these projects of the past 20 years have focused on improving our understanding of our surface water resources, but a considerable number of projects also focused on groundwater and springs. Only a few projects integrated surface water and groundwater. Moving forward I expect more emphasis will be placed on integrated surface hydrology and management as we continue to realize the importance of hydrologic connectivity.



The state of Oklahoma is unique in its hydrologic gradient from east to west typically characterized by differences in precipitation. This gradient is also characterized by local and regional water issues: primarily water quality in eastern Oklahoma and water quantity in western Oklahoma. Interestingly, and partly due to the latest drought conditions, the focus of recent projects have shifted more towards water quantity, as shown in the graph below. In 2008, 2009, 2011, and 2014, all three projects funded through this program were water quantity projects.



Grants from 1996-2015 have supported researchers across a wide-range of disciplines (agricultural sciences, physical sciences, engineering, health sciences, and social sciences) and in many cases, the projects were truly multi-disciplinary projects.

The grant program is open to *any Oklahoma university researcher*. Proposals selected for funding are sure to be successful and impactful projects following a three-stage review process: (i) past performance on grants, as judged by the director and staff; (ii) peer evaluations of scientific merit and likelihood of success; and (iii) ranking by an advisory board of water professionals in Oklahoma on how well the proposal addresses the needs of the state. Researchers are encouraged to work with state or federal agencies to ensure projects meet the needs of the state. Examples of potential agencies with whom to collaborate may be found on our [Advisory Board page](#).

Please see [page 7](#) for more information and [contact the Water Center](#) with additional questions about this grant program!

We look forward to receiving a large number of proposals this year!

BRACE FOR IMPACTS: Shaping Oklahoman Water Knowledge (by Jonathan Anthony, OWRC staff writer)

The USGS 104(b) grant program was initiated more than 50 years ago to support the symbiotic relationship between researchers and Oklahoma's future water needs. This seed money helps introduce researchers to colleagues with similar goals, and their collaborative effort is designed with Oklahoma's future in mind. One example is Justin Moss, from Oklahoma State University's Department of Horticulture & Landscape Architecture, who used the grant to understand how much Oklahomans know about water conservation and produce some conservation guides for beginners.

Justin Moss' study titled "Water conservation in Oklahoma urban and suburban watersheds through modification of irrigation practices" was an investigation into the current conditions of water use in Oklahoma. With the expertise of Tracy Boyer, associate professor in OSU's Department of Agricultural Economics, Moss examined outdoor water use in Oklahoma through conducting surveys focused on irrigation and conservation methods, determining recommended plants for the landscape, and delivering workshops to educate master gardeners about proper irrigation output.

"We wanted to understand how people were watering the landscape," Moss said, "If they watered the lawn, what were their practices and what determined those practices?" After gathering information on Oklahoman knowledge and water usage around homes, areas, and businesses, Moss and Boyer applied this data to inform the public through journal articles, a factsheet, and a new Extension website to teach homeowners about outdoor water conservation, <http://thinkwater.okstate.edu>.



ThinkWater is ideal for those interested in establishing a water-efficient landscape, providing information on design, soil improvement, efficient irrigation, turfgrass management, plant selection, mulch usage, and general maintenance. "We made this website for people wanting to be more mindful in how they used water in the landscape and around their home," Moss said. Moss also used the initial grant to expand his programs to the most

populated areas statewide. For example, he brought his findings and experience from the USGS 104(b) grant to Oklahoma City to inform their water conservation campaign. "We are currently working with them to develop public information videos, advertisements, radio spots, and a website for the city at squeezeeverydrop.com. It is an overall campaign to give people a few simple ideas to save water around their home," Moss said.

The websites for both ThinkWater and Oklahoma City's Squeeze Every Drop were developed by Malarie Gotcher, one of Moss' extension associates who began a success story of her own. "She focused her time on educating Oklahoma City customers about water conservation, and did such a good job that the city created a water conservation position and hired her for it," Moss said. Students who worked on the initial USGS 104(b) grant all completed their Masters degrees and used their experience to start their careers; JoDee Schmidt, John Haase, and Courtney Keck graduated with degrees in Agricultural Economics, Environmental Science, and Horticulture, respectively.

With the help from the 104(b) grant, Moss was able to receive additional funding for larger projects. "**This first grant really helped initiate the work and partnerships necessary to be competitive and successful for larger grants from other funding agencies,**" Moss said. "For example, we now have a United States Department of Agriculture grant working on water use issues with Texas A&M, the University of Georgia, the University of Florida, and North Carolina State University. It also contributed to our recent Division of Agricultural Sciences and Natural Resources grants on turfgrass drought resistance and responsible outdoor water use."

Moving forward, Moss intends to continue exploring how people make water decisions in urban areas and providing methods to use water wisely. Moss hopes to "continue to work with educating this group of water customers and managers, and given the distribution of drought in our state, begin working in central to western Oklahoma."

For more information about the USGS 104(b) grant, please visit the Water Center's [104\(b\) page](#). To learn more about saving water around your home and landscape, visit <http://squeezeeverydrop.com> and <http://thinkwater.okstate.edu>.

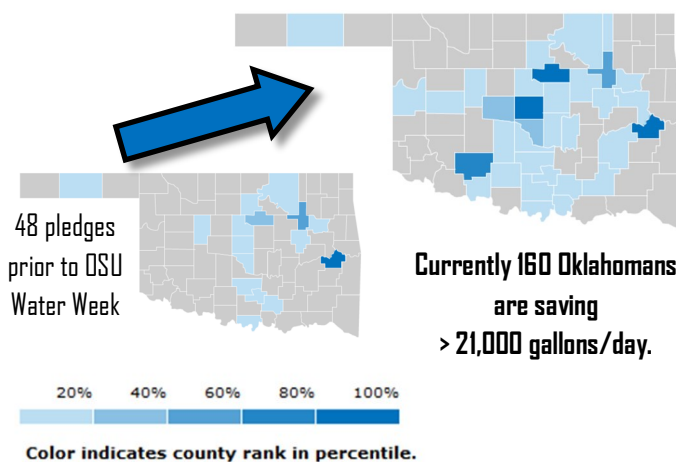
Student Water Conference Update

At the interface between teaching and research, the 4th Annual Student Water Conference was held on the Oklahoma State University campus March 26-27, 2015 and was a huge success! This year's conference included presentations by 62 students representing universities from across the country. This conference is sponsored by the Buchanan Family Trust through the Buchanan Endowed Chair, USDA NIFA, and the Oklahoma Water Resources Center. Students had the pleasure of hearing two keynote speakers. The Buchanan Lecture was given by OSU alumnus and Executive Director of the Oklahoma Water Resources Board, **J.D. Strong**, who emphasized the need to *generate sound research for guiding sound policy decisions*. **Dr. Maria Chu**, an OSU alumna and Assistant Professor at the University of Illinois, presented water careers and her perceptions from her roles with universities and private consulting firms. We also appreciate the outstanding advice given by **Dr. Sherry Hunt** (USDA-ARS), **Dr. Bill Andrews** (USGS OK Water Science Center), **Dr. Trisha Moore** (Kansas State University), and **Mr. Dan Yates** (Groundwater Protection Council) during a roundtable discussion of water issues and careers.

Next year's conference is scheduled for March 24-25, 2016 ([more here](#)). If you are a student, put this exciting event on your calendar and faculty please encourage your students to participate!

This conference was part of OSU Water Week, which started with a [40-gallon challenge](#) to Oklahomans to reduce daily water usage by 40 gallons. More than 100 people accepted our challenge, resulting in an additional savings of nearly 13,000 gallons per day. **What an achievement!**

It's not too late! Won't you take the challenge today with your friends and family to conserve?



Announcements from the Water Center:

- ◇ In March 2015 **Dr. Garey Fox** was appointed Director of the Oklahoma Water Resources Center.
- ◇ The Oklahoma Water Resources Center was recently appointed to take a leadership role on a NSF EPSCoR Project between OSU, OU, University of Tulsa, and the Noble Foundation on “Adapting Social and Ecological Systems to Climate Variability.” As part of this role, the Water Center is seeking a full-time program coordinator, who will interface with the Oklahoma Water Resources Center and help guide research efforts on the Oklahoma State University campus. Find out more at <http://water.okstate.edu/opportunities/employment>.
- ◇ Our Advisory Board is seeing some changes. We welcome **Bekki Harjo**, representing the NWS-NOAA/Arkansas-Red River Basin Forecast Center; **Wayne Kellogg**, representing the Chickasaw Nation; and **Sherry Hunt**, representing the USDA-Agriculture Research Service. **Jeremy Seiger** will join the Board to represent the OK Department of Agriculture, Food, and Forestry—a position formerly filled by **Dr. Quang Pham**. We wish Dr. Pham the best in his retirement!
- ◇ Planning has just begun for the Governor's Water Conference and Research Symposium. Visit our website, join our mailing list, or follow us on social media for the latest information.
- ◇ 50 years ago we funded the first of many research projects. To date, more than 75 research projects have benefited Oklahomans.
 1. Reduction of Water Application Losses Through Improved Distribution Channel Design (James E. Garton, OSU)
 2. Ecological Factors Affecting Turbidity and Productivity in Prairie Ponds in the Southern Great Plains (Dale W. Toetz, OSU)
 3. Chemical and Thermal Characteristics of Keystone Reservoir (Troy Dorris, OSU)
 4. Development of Design Criteria for Individual Domestic Water Supplies from Surface Impoundments (Elmer R. Daniel, OSU)
 5. Enzymes and Catalysts for Purification of Industrial Waste Water (James E. Fulton, OSU)

STUDENT SECTION:



NSF REU selections have been made for 2015 summer project, which focuses on stream restoration and rehabilitation practices and approaches. After an intensive application and selection process, seven undergraduate students from across the United States were chosen to conduct research with OSU faculty members this summer. Participants include the following students:

- **Chris Crown**, a sophomore environmental science major at Illinois Wesleyan University working with *Dr. Chris Zou* in Natural Resource Ecology and Management.
- **Jenna Fontaine**, a junior with a dual major in physics/civil engineering at the University of Puget Sound in Washington state working with *Dr. Todd Halihan* in Geology
- **Megan Knight**, a junior in fisheries and wildlife at Southeastern Oklahoma State University working with *Dr. Andy Dzialowski* in Zoology
- **Bailey McNichol**, a senior in natural resources and Spanish at the University of Connecticut, working with *Dr. Garey Fox* in Biosystems and Agricultural Engineering
- **Jordan Muell**, a senior in agricultural engineering at Iowa State University working with *Dr. Jason Vogel* in Biosystems and Agricultural Engineering
- **Eric Pasay**, a junior in environmental science at Clark University in Massachusetts working with *Dr. Shannon Brewer* in Natural Resource Ecology and Management and the Oklahoma Cooperative Fish and Wildlife Unit
- **Ellen Woytowitz**, a junior in environmental science at the University of Maryland Baltimore County working with *Drs. Shannon Brewer and Garey Fox*



The Water Center congratulates **Peter Storm**, undergraduate student in Biosystems & Agricultural Engineering, and **Rebecca Purvis**, graduate student in Biosystems & Agricultural Engineering, for being awarded prestigious National Science Foundation (NSF) Graduate Fellowships on water research. Both students will be pursuing graduate degrees related to water resources.

The Water Center can assist in preparing applications for both the NSF Graduate Fellowship Program and the US EPA STAR Graduate Fellowship Program for any students interested in working on water-related research.

Faculty Spotlight: Max Melstrom

(by Max Melstrom, Agricultural Economics Assistant Professor)

I joined OSU's Department of Agricultural Economics in June of 2014 with a research and extension appointment focused on the economics of natural resources. This being Oklahoma, naturally much of my time has been taken up with water issues. I could not be happier!

I grew up in northern Michigan with a 1000-acre lake in my backyard and studied recreational fisheries as a graduate student. I graduated with a PhD in economics from Michigan State University in 2012, with a specialty in measuring the value people place on environmental assets.

My work at OSU involves quantifying the benefits of Oklahoma's water resources, including lakes, streams and rivers. Environmental and natural resources provide a wide array of services to people (now called "ecosystem services"), and quantifying their value provides useful information to decision makers. In the past, environmental services were largely taken for granted, with the result that their value went unmeasured and ignored. It was even easy for some people to assume that these values were zero, for lack of a "market price." But by the end of the 20th century economists had developed numerous methods capable of valuing non-marketed goods and services, especially those produced by the environment.

My research is focused on measuring the direct benefits of the environment, including environmental goods that serve as direct inputs into production, support recreational activities or have existence value. Currently, I am examining the effects of water quality and quantity at Oklahoma lakes on recreationists. It is very clear that a reservoir's recreational value is sensitive to its water quality and water levels. Ignoring the influence of water conditions on a reservoir's value can (and does) result in inefficiencies and a lower overall value.

I always welcome the opportunity to highlight the value of the environment, so please [contact me](#) if I can help with water protection efforts through either research or outreach.



Dr. Max Melstrom



OKLAHOMA COOPERATIVE EXTENSION SERVICE NREM-101

Are Herbicides Safe to Use in My Pond?

Do you have a pond weed problem? Often what is needed in the short term, is something to eliminate the problem plants without being toxic to other aquatic life or harmful to humans. Approved aquatic herbicides applied according to label directions meet these criteria. This factsheet will get you started as you work with your county Extension Agriculture educator to select an herbicide and formulate long-term management practices to restore a healthy balance between plants, fish, and the other important uses of your pond.

Read the full factsheet at <http://osufacts.okstate.edu/docushare/dsweb/Get/Document-9699/NREM-101.pdf>.



2016 Request for Pre-Proposals in Water Research

The Oklahoma Water Resources Center invites pre-proposals for water research projects from any Oklahoma research university through the USGS 104(b) grants program.

The 2016 application process will begin with one-page pre-proposals **due June 12, 2015**. Multiple pre-proposals representing distinct research projects from the same researcher are welcome. The Water Research Advisory Board ([WRAB](#)) will meet mid-late July to review the pre-proposals and select 5-8 projects whose PIs will be invited to submit a full proposal. The actual number invited to continue in the competition will be determined by the WRAB based on the quality of the pre-proposals, the potential of the project to address important water problems in Oklahoma, and the availability of funds.

Funding: Funding is contingent upon USGS funds being provided. We anticipate contributing **up to \$25,000** to each successful proposal through the USGS 104(b) grants program. Applicants need to provide a 2:1 match in non-federal funds. All indirect costs (F&A) must be waived, but can be counted as match. Salaries, benefits, and other project-related expenses covered by other state sources may also be counted as match. (For example, a project costing \$75,000 could apply for \$25,000 from the USGS 104(b) grants program and obtain a 2:1 match through the PI's institution and waived indirect costs for the remaining \$50,000.)

Timing: Grants will be awarded to support one-year projects. Longer projects must be divided into discrete, one-year proposals with distinct deliverables. The project year extends from March 1, 2016 to February 28, 2017.

Format: Pre-proposals must be submitted in Word format, be single-spaced in 10-pt Arial font, and cannot exceed one page. The pre-proposal should briefly explain the project objectives, methods, and expected outcomes, and also list the project personnel. Where appropriate, pre-proposals should include extension/outreach efforts and one-sentence descriptions of team members' expertise. Budget information and detailed investigator qualifications are not necessary.

Deadline: Pre-proposals must be submitted to water@okstate.edu before midnight **June 12, 2015**.

Priorities: Priorities were identified by the WRAB and may be found at <http://water.okstate.edu/opportunities/funding/104b-state>. Priorities are not limited to this list; the Board will consider proposals for *applied* research on any water-related topic. Pre-proposals that do not match these priorities will be given full consideration.

New & Noteworthy

Conferences/Seminars (water.okstate.edu)

- Oklahoma Water Survey Plans Water Reuse Workshops (Norman; 5/14, 6/18)
- Texas Tech University hosting NSF Day (Texas Tech; 5/20)
- 2015 Workshop at MOISST (Stillwater; 6/2-3)
- American Ecological Engineering Society Annual Conference (Stillwater; 6/3-5)

Job openings (water.okstate.edu/opportunities/employment)

- Research Civil Engineer (Hydraulics) for Hydraulic Engineering Research Unit in Stillwater, OK (closes 5/29)
- Research Associate for USDA-ARS in El Reno, OK
- Postdoctoral Research Associate (USDA-ARS) in Stillwater, OK

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

- USGS 104(b) Oklahoma Competitive Research grants (due 6/12)
- U.S. Army Corps of Engineers' Institute for Water Resources (due 7/13)
- Many, many more!

[WWWeb Updates]

- ◇ The [Educational Videos page](#) has been completely redesigned to be more organized and easier to navigate.
- ◇ [Our YouTube channel](#) has scores of new videos posted and arranged by topic. New in-service training will be added soon.
- ◇ [Opportunities](#) for funding and employment abound.
- ◇ Be the first to know about the latest additions! [Subscribe to the RSS feed](#).



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