

An aerial photograph of Grand Lake O' the Cherokees and its watershed. The lake is a large, winding body of water, surrounded by dense green forest. A long, low dam is visible in the background, stretching across the width of the lake. The foreground shows a river flowing into the lake, with a small bridge crossing it. The overall scene is a lush, green landscape with a large body of water and a prominent dam.

An Overview of the Ongoing Research in Grand Lake O' the Cherokees and its Watershed

Rich Zamor

GRDA Ecosystems and Watershed Management

Enabling Legislation

(Title 82 Chapter 8 Section 861)

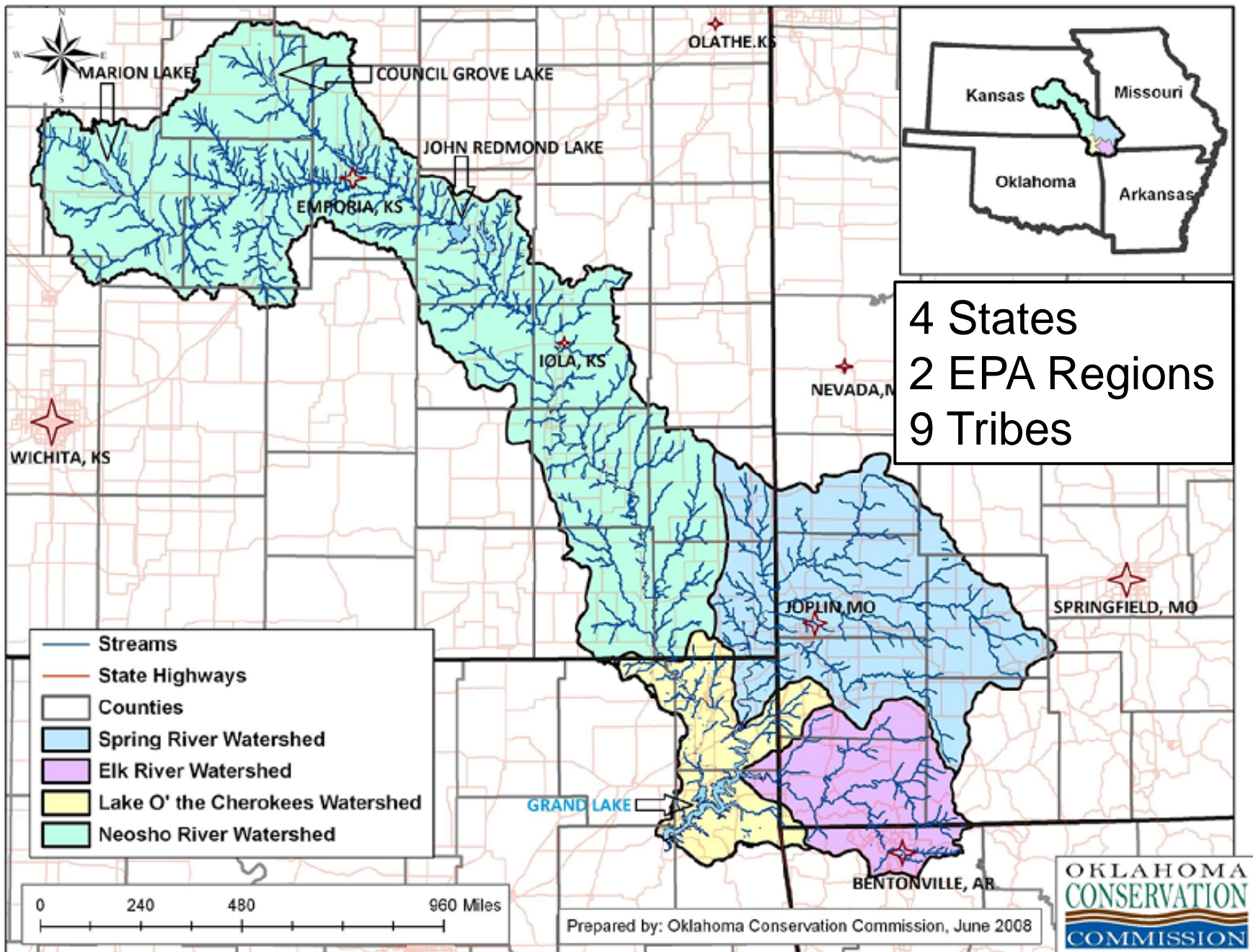
- Establishes GRDA as a conservation and reclamation district for the waters of the Grand River.
 - “...including the control, storing, **preservation** and distribution of the waters of the Grand River and its tributaries, for irrigation, power and other useful purposes and **reclamation** and irrigation of arid, semiarid and other lands needing irrigation, and the **conservation and development of the forests, minerals, land, water, and other resources** and the conservation and development of hydroelectric power and other electrical energy, from whatever source derived, of the State of Oklahoma.”
 - (d) To forest and reforest and to aid in the foresting and reforesting of the **watershed area of the Grand River and its tributaries**;

5 E's of Excellence

- ***Environmental Stewardship:*** We will practice environmental awareness and promote conservation and reclamation of the natural resources under our control



Grand Lake Watershed



Responsibilities and Goals of Ecosystems & Watershed Management

1. To support and/or complete any required projects for FERC compliance.
 - a) Any emergency response to protect health and public safety (e.g., call outs, blue-green algae blooms, fecal contamination, fish kills).
2. To implement and conduct a long-term water quality monitoring program on our project lakes and land and wildlife management on our watershed properties.
3. To support any collaborative projects with other research entities such as universities, state or other agencies.

Additional responsibilities include lab equipment and space maintenance, field equipment maintenance, QA/QC checking, lab/field supply inventory and ordering, and outreach (including social media and website presence).

Current ecological projects – FERC compliance & Emergency Response

Grand

- Relicensing – PAD, Studies, etc...
- Heavy-use cove monitoring
- Boat counts – Summer holidays
- Bat surveys & Bat Cave Monitoring
- Neosho Bottoms Wetlands

Emergency Response

- HABs and BGA reports
- Fecal contamination
 - Fecal Bacteria Management Plan
- Fish Kills, OKRMT
- Electrified/dilapidated docks

Hudson

- Aquatic Resources Enhancements
- Creel survey – with Pitt State and ODWC
- Fish Stocking
- Bald eagle counts
- Annual report on migratory birds

Pumpback

- Vegetation Management Plan
- RT&E Species

Heavy Use Cove Monitoring

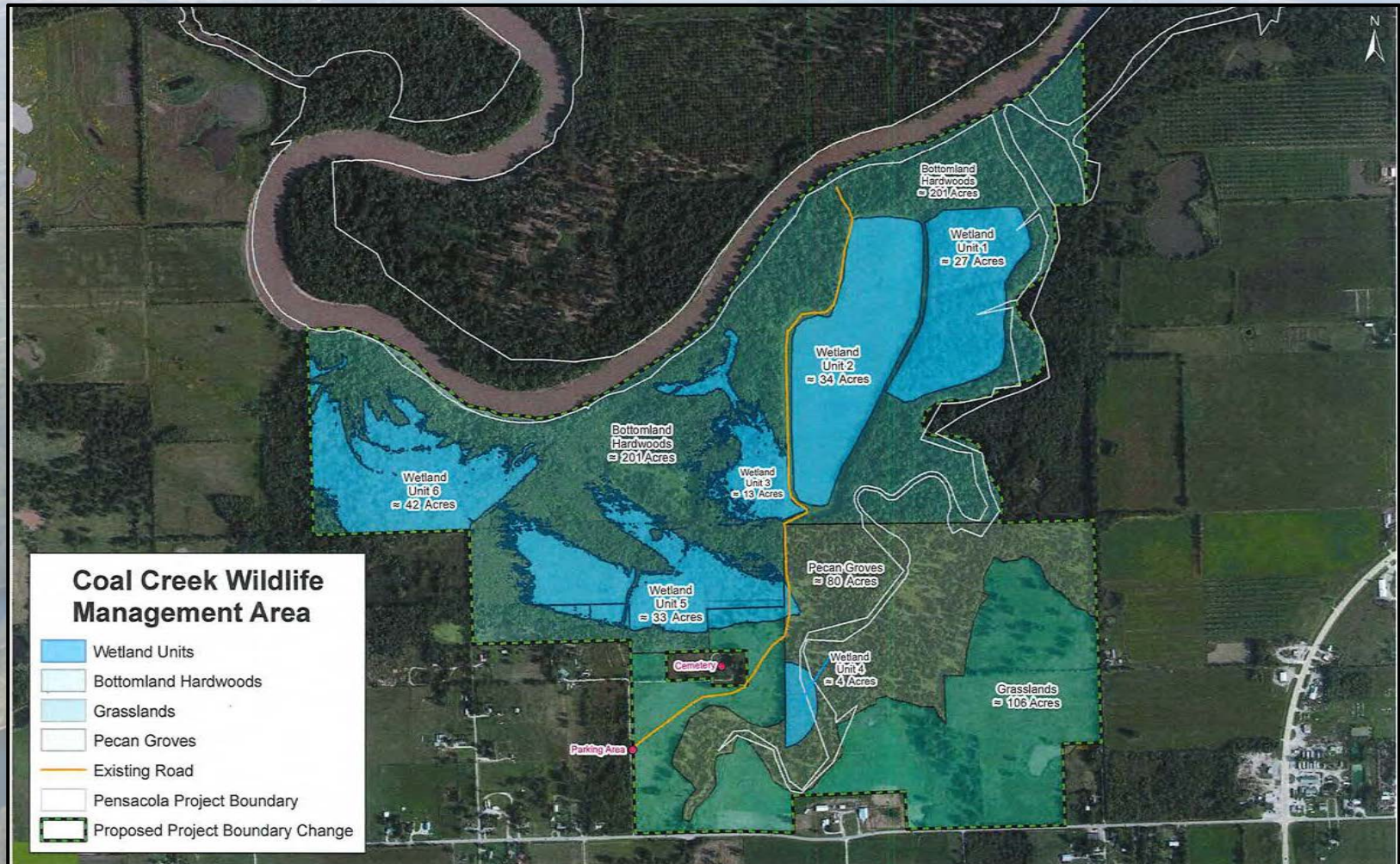
Grand Lake ...

*Oklahoma's Premiere
Recreational Destination...*



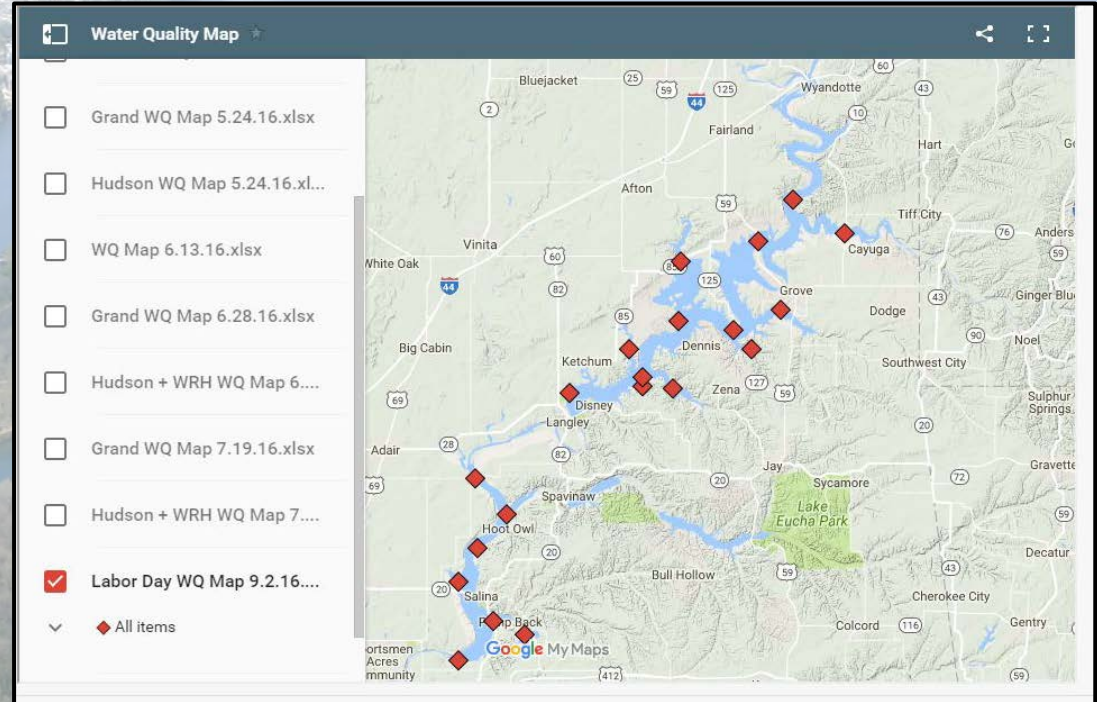
Neosho Bottoms/Coal Creek Management Area

- 540 Acres managed jointly with ODWC to meet mitigation requirements for Article 411 on the current license



Current ecological projects related to water quality monitoring

- Long-term water quality monitoring
 - Grand – 12 sites
 - Hudson – 7 sites
 - Pumpback – 1 site
- Bi-weekly sampling in recreation season; Monthly sampling in the offseason



Wildlife Management

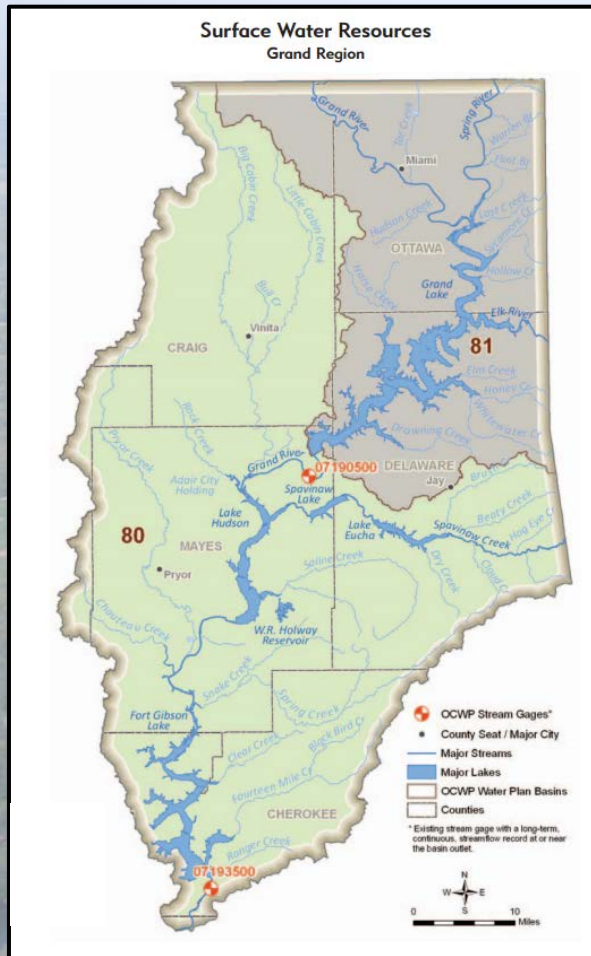
- GRDA owns about 3600 acres in Ottawa County –
 - About 50% is grasslands, 20% Bottomland Hardwood Forests, 20% Wetlands and the remaining is mostly pecan orchards.
 - Restoration efforts started in the spring of 2016.
- Paralyzed Veterans of America have exclusive access to about 750 acres to hunt deer, waterfowl, and turkey.
 - Working to expand access to hunting through a hunting program managed by GRDA.



Fisheries Management



GRDA's Comprehensive Water Plan



- Interagency Agreement with the Oklahoma Water Resources Board
- Grand River Basin
 - Develop Multi-Reservoir Management Model
 - Grand, Hudson, Ft. Gibson
 - Operational Range for Grand Lake (Support FERC Relicensing)
 - Develop Surface Water Permitting System
 - Water Rights and Permitting Authorities
 - Water Budget/Allocation of Surface Water
- Ground Water Allocation

Regional Conservation Partnership Program (RCPP):

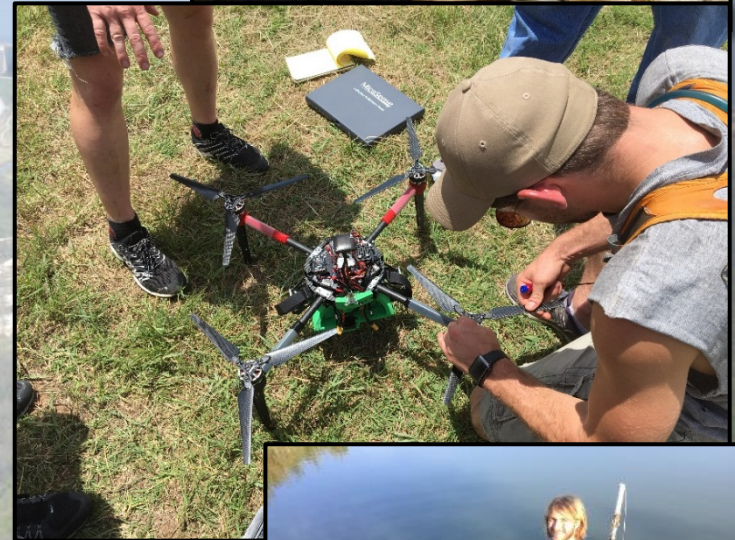
- New program to get a federal grant administered by the Kansas Forest Service and OCC. Working with Agriculture to install BMPs and improve water quality
- Oklahoma Conservation Commission
- The Natural Resource Conservation Service
- Kansas Dept. of Agriculture
- Kansas Dept. of Health and Environment
- Kansas Forest Service
- Craig, Delaware, and Ottawa Conservation Districts

University Partners



Current ecological projects with University Partners

- 5-year Watershed Project
 - Interdisciplinary team
 - Data compilation & State of the Lake
 - Hydrological Modelling
 - Watershed and Reservoir Quality – New Buoys deployed
 - Watershed Spatial and Biogeochemical modelling – UAS work w/Nairn students
 - Microbial Source Tracking – sterols and Genetics
 - Map and Data Portal
 - Public communications workshops
 - Remote Sensing of Algal Blooms
- Other Projects
 - 10-year agreement – Graduate Fellowships
 - Capstone class
 - Rotifer species
 - Geography and Environmental Stability Internships



Current ecological projects with University Partners

- Zooplankton Community
- Cyanobacteria bloom
Stoichiometry & Metals (Fe)
- Metal Tolerant Snails
- Lake Amenities Evaluation
Study (Hedonic and
Recreational)
- Microbial Community Studies
- 1 peer-reviewed publication
last year and 1 submitted this
year with another in prep
- Remote Sensing of Algal
Blooms



Current ecological projects with University Partners

- *PSU*

- Crisis communication
- Watershed Educational Campaign Project Survey
- Wetland Vegetation Survey

- *Rogers State*

- Acoustic bat surveys – FERC

- *NEO*

- Neosho bottoms
- Agriculture Education
- Pecans, grazing, land, and fire management

- *NSU*

- ~~Future~~ New Partner!
- Scenic rivers, Environmental and Water Science Program

Chapter

Communicating Climate-Change and Natural Hazard Risk and Cultivating Resilience
Volume 45 of the series Advances in Natural and Technological Hazards Research pp 189-204

Controlling Environmental Crisis Messages in Uncontrollable Media Environments: The 2011 Case of Blue-Green Algae on Grand Lake O' the Cherokees, OK

Alicia M. Mason ✉, James R. Triplett

NEO, GRDA form agriculture education partnership



DANNIE LEE OLIVEAUX / MNR

Scenic Rivers Operations

- July 1, 2016 GRDA Absorbed the Oklahoma Scenic Rivers Commission
- Maintaining current relationships and monitoring by USGS
- Looking for ways to enhance the current programs
- New Partnership with NSU



Grand River Dam Authority Ecosystems & Watershed Management shared Oklahoma's Responsible Water Policy's post.

Published by Grda Eco [?] · August 23 at 1:36pm · 🌐

OSU will be conducting studies on the carrying capacity on the Illinois River
#GRDA #waterquality



Oklahoma's Responsible Water Policy

August 23 at 11:12am · 🌐

<http://www.newsobserver.com/n.../business/article97134337.html>



Oklahoma State University to study Illinois River

Oklahoma State University is set to conduct a study on the impact of the number of people and boats on the popular Illinois River.

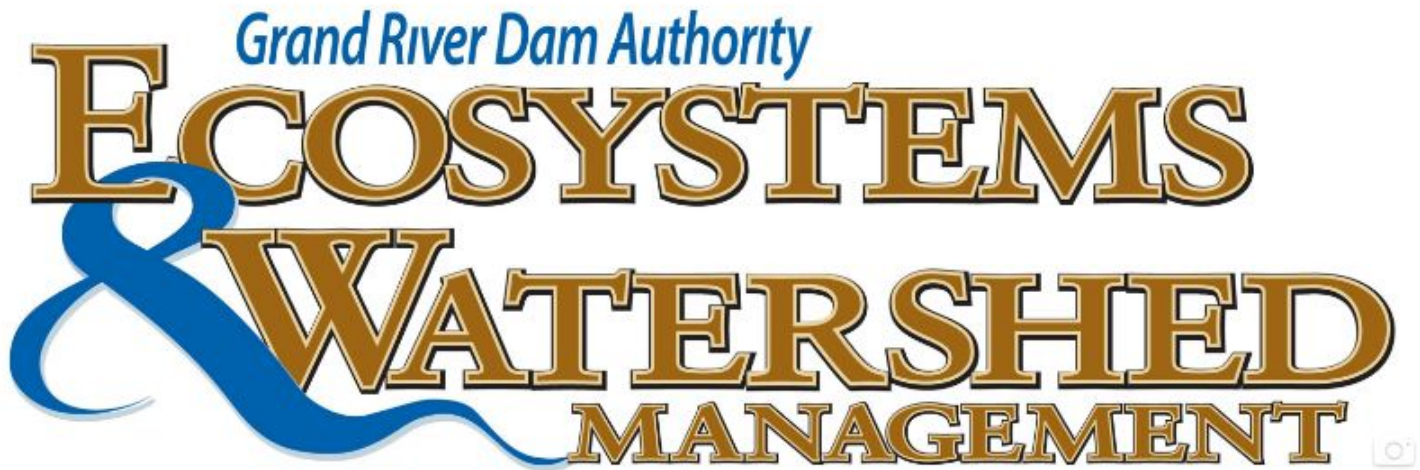
SOCIAL MEDIA

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Grand River
Dam Authority
Ecosystems &
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Questions?

