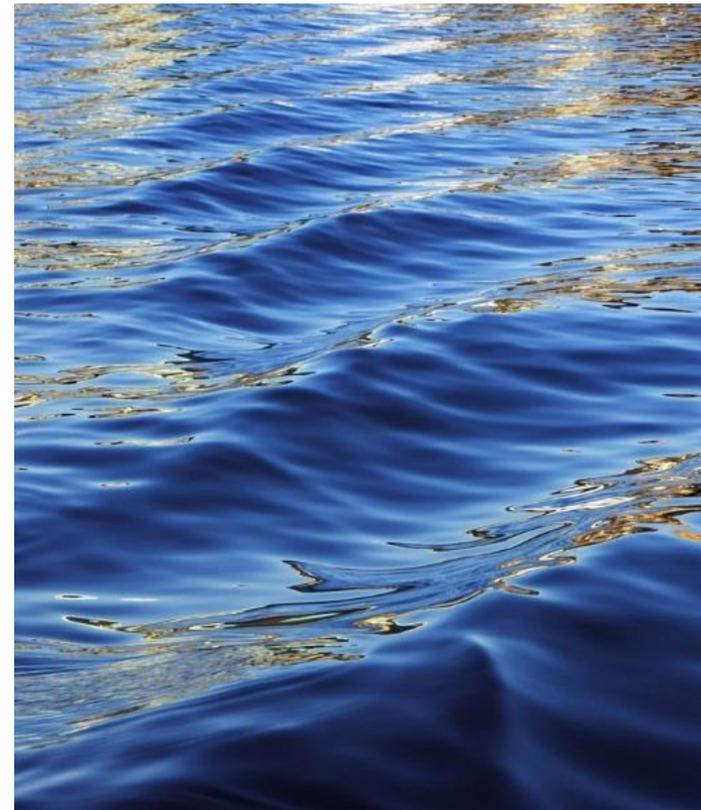




Maximizing Water Storage Capacity Through Conservation Practices

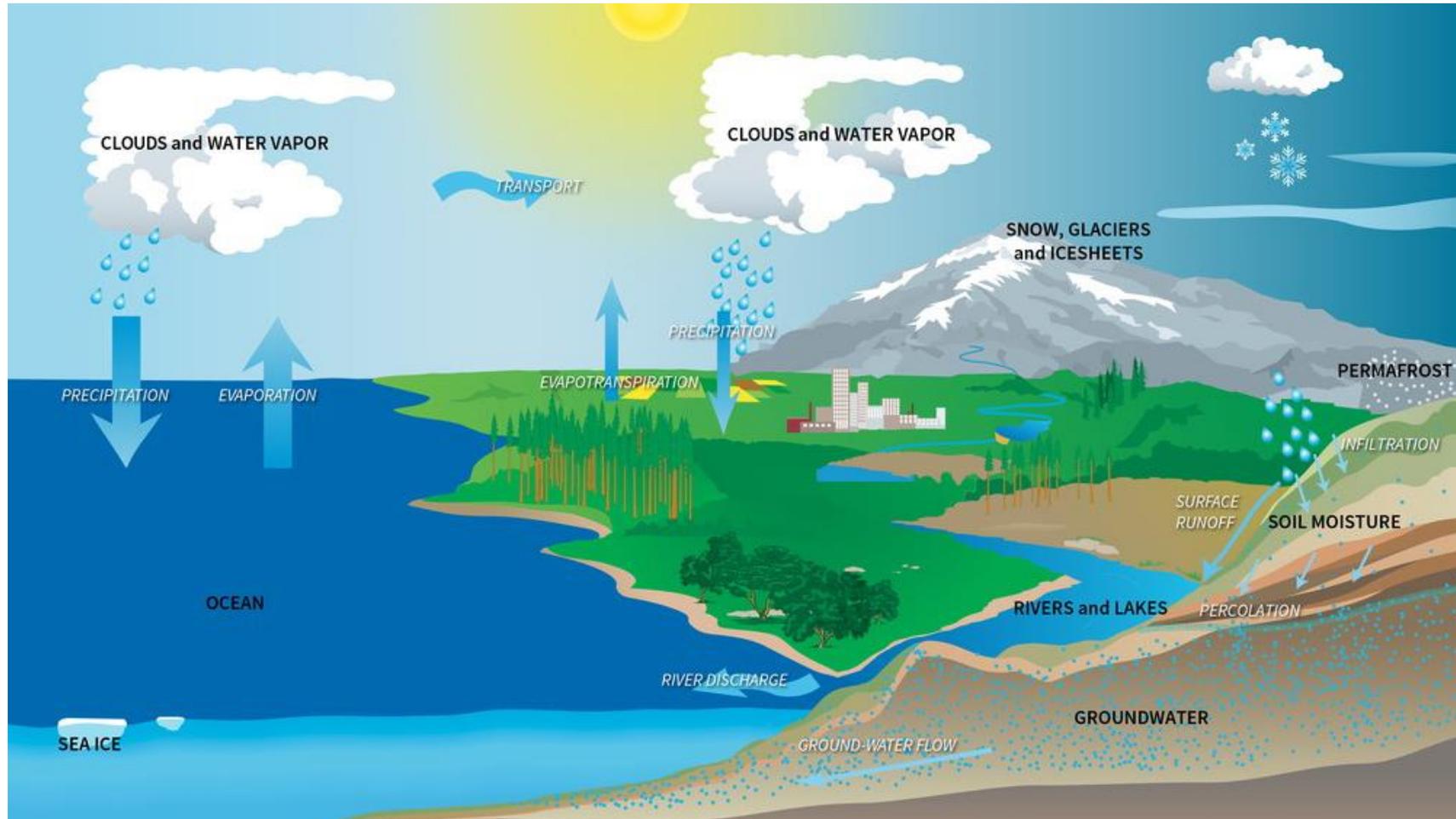
2018 Oklahoma Governor's Water Conference, Reed
Center, Midwest City, OK



Water: We are most concerned when there is too much or not enough...



Water Cycle Out of Balance with Oklahoman's Needs



And not a drop was fit to drink...



What Are Conservation Practices (CPs)?

- “ Methods which reduce soil erosion and retain soil moisture.” defined by USDA National Agricultural Library
- Typically thought of as practices that reduce soil erosion, improve water quality, and to optimize the farming process for the long-term.
- Modes of action typically try to replace or reproduce “natural” processes in the landscape.
- Generally implemented on a voluntary basis



Impacts of Conservation Programs

- Primarily funded through USDA Natural Resources Conservation Service and Farm Services Agency
- Between 2005 – 2017 14 conservation programs authorized in USDA Farm Bills
- Average \$68 million in financial assistance per year in Oklahoma
- Total more than \$886 million in financial assistance to landowners and partners between 2005 – 2017.
- There are an average of 23,000 contracts per year installing conservation on 3 – 13% of Oklahoma per year.

Conservation Practices Maximize Reservoir Storage Capacity

- OK ARS documented reservoir capacity loss rates in Little Washita River Watershed ranging from 0.84 – 2.20 percent per year.
- Daniel Wisleder (OSU graduate student) in 2004 estimated that flood control structures in the Upper Washita River Basin were 0.8 – 54.2 percent filled with sediment.
- Graf. et. al (2010) found reservoir storage across the U.S. lost an average of 0.04 – 2.00 percent annually (OK ranged typically from 0.81 – 1.20 percent)
- USDA (2012) found that conservation practices could reduce edge of field sediment losses by as much as 52 percent.

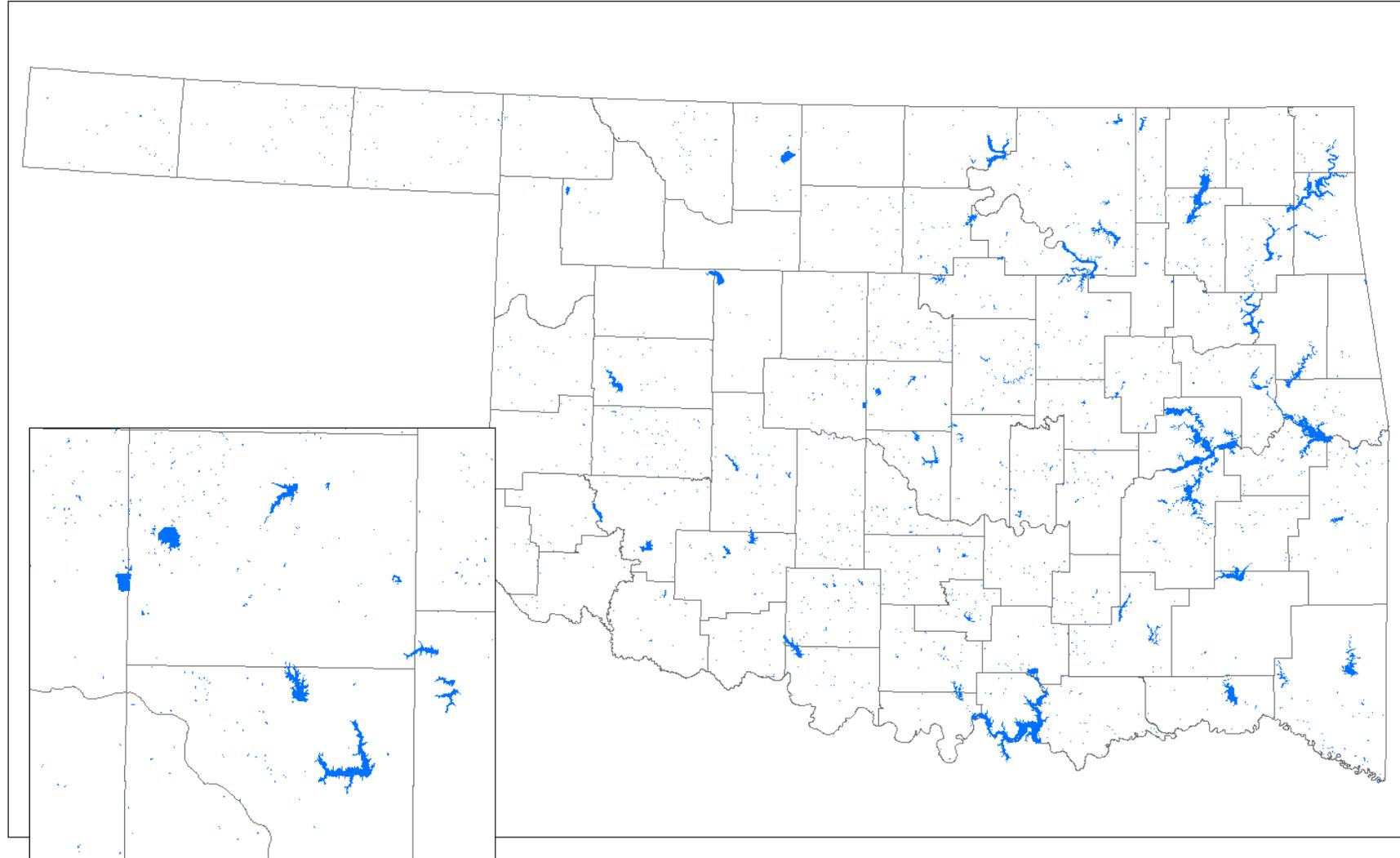


Conservation Practices Create Surface Water Storage

- Upstream Flood Control Structures- >50,000 surface acres of water storage
- Wetland Creation: Since 2005, have created at least 16,778 acres of wetlands
- Livestock ponds- since 2005, USDA programs have constructed almost 5,500 ponds on grazing lands



Oklahoma is the Land of 10,000 lakes



Conservation Practices Can Improve Irrigation Efficiency

- Approximately 430,000 acres (16% of total farmland) are irrigated farmland in Oklahoma (2013 FRIS).
- USDA NRCS has improved irrigation water management on over 100,000 acres since 2005
- Efficiencies have led to reductions of as much as 40% of water use in OK panhandle

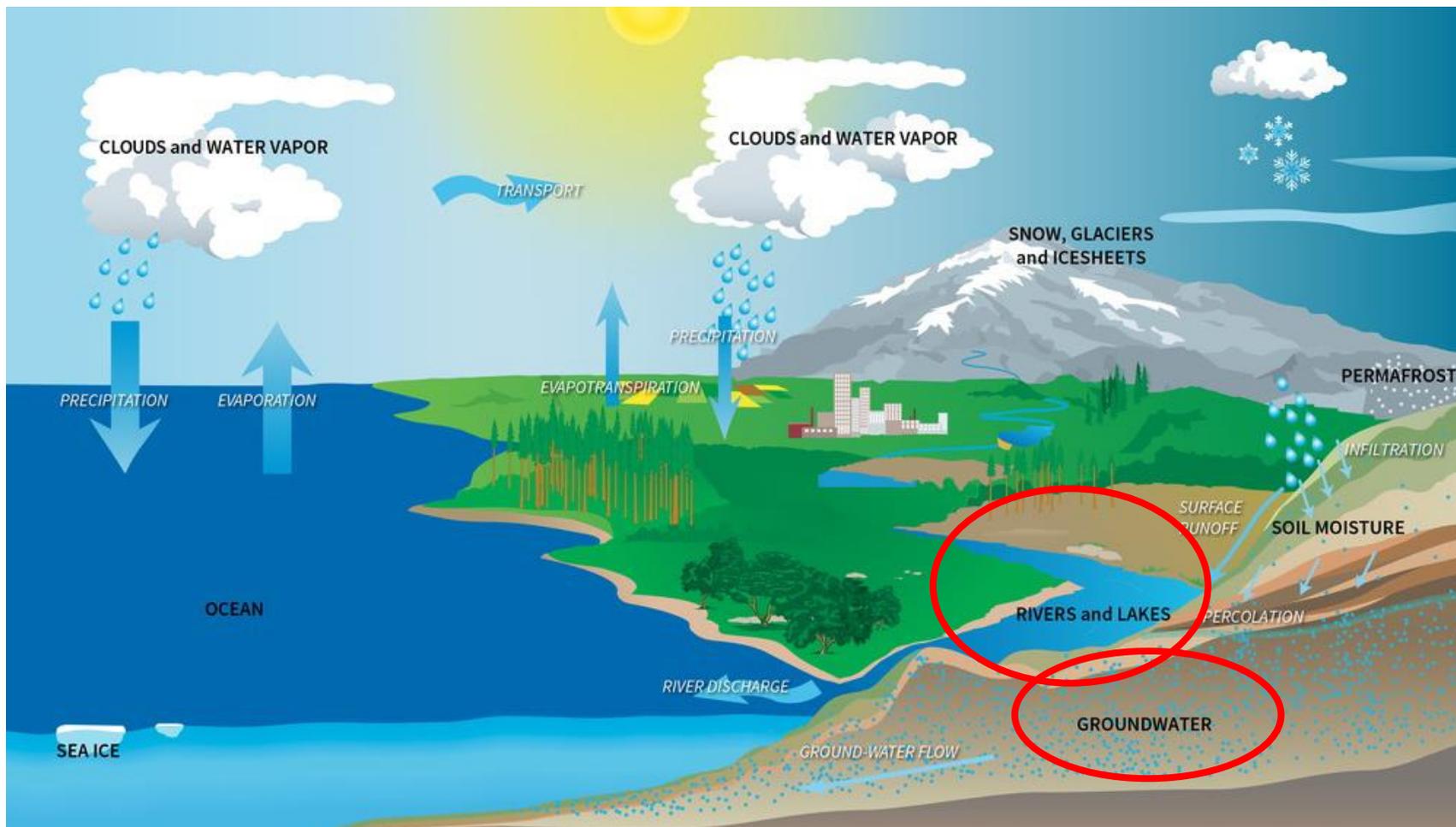


Brush Management- Removal of Invasive Woody Species

- Invasive woody species such as salt cedar and eastern red cedar have spread to throughout the state
- Evergreen- use water all year
- Water use depends on size and area of the state, but can range from <1 to >40 gallons/day
- Removal replaces these woody species with vegetation that typically use less water throughout the year.
- Since 2005, approximately 17% of USDA grassland improvement practices have been brush management (approx. 375,000 acres)



Maximizing Water Storage Capacity Through Conservation



How Do We Increase Water Storage?

- **Build or increase capacity in another reservoir!**



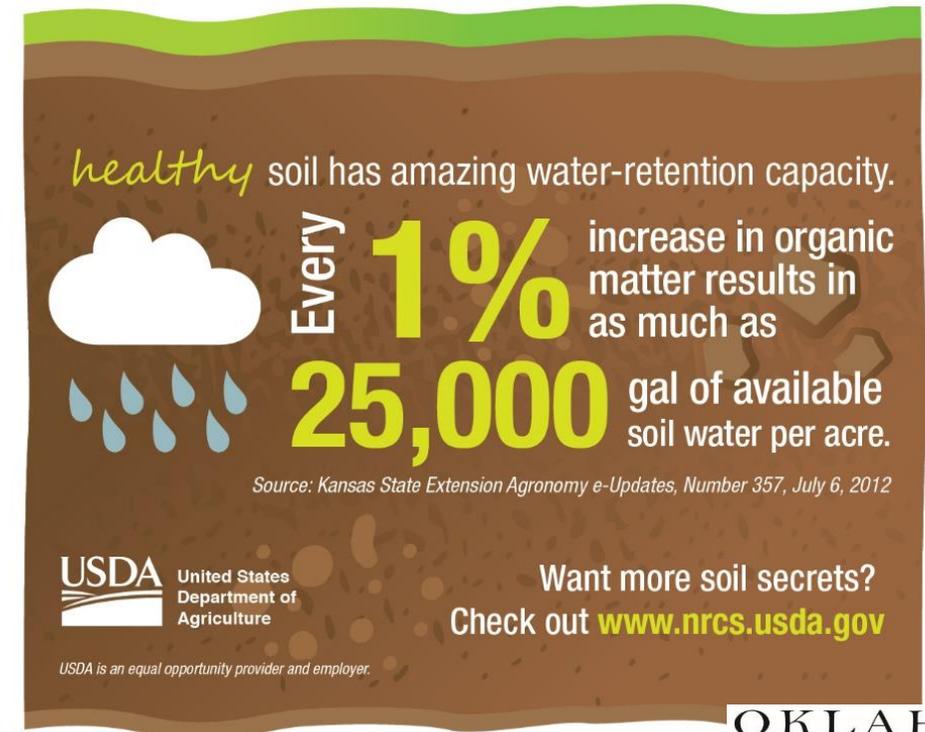
Use Oklahoma's Soil as a Water Reservoir

- Continuous cultivation has reduced Oklahoma soil organic matter levels from 4% to about 1% on cropland
- Loss of 75,000 gallons per acre storage
- 34 million acres farmland X 25,000 gallons = loss of **850 billion** gallons of water storage = 32% of Oklahoma major reservoir storage capacity.

USDA-NRCS SOIL HEALTH INFOGRAPHIC SERIES #002



what's underneath



Conservation Practices that Increase Water Holding Capacity of Soil

- No-till
 - Maintains channels created by plant roots
 - Reduces compaction
 - Increases organic matter
 - Increases biological activity
 - Shades and insulates the soil surface
- Cover Crops
 - Same as above, but wider variety of plants increases those effects
- Improved Pasture Management
 - Less compaction
 - More organic matter recycling, less runoff



Healthy Soils Weather the Storms



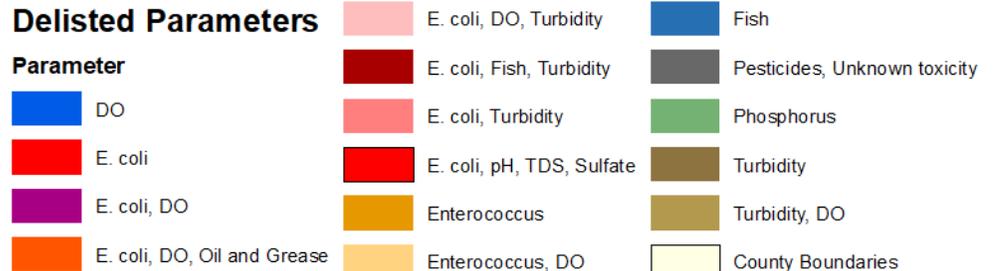
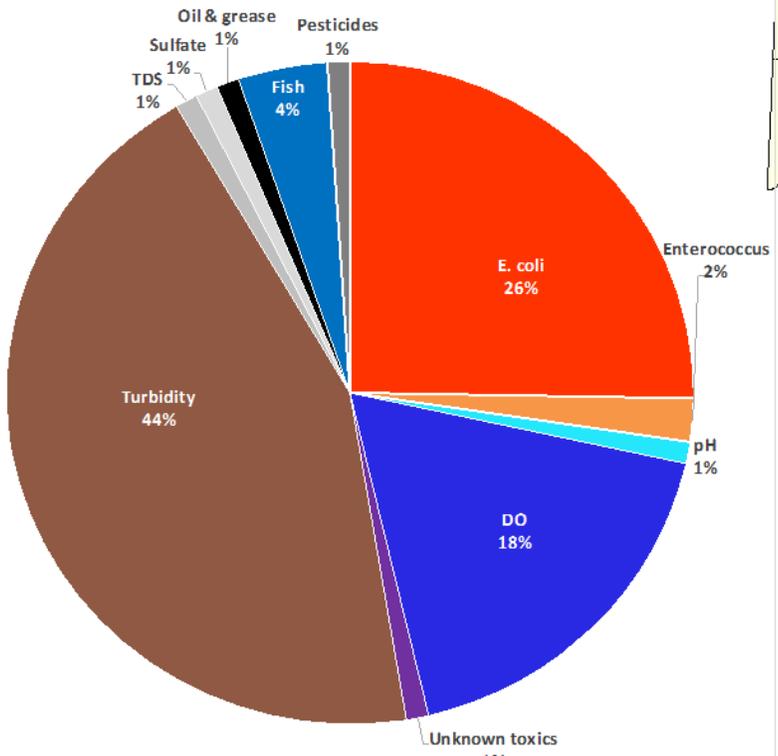
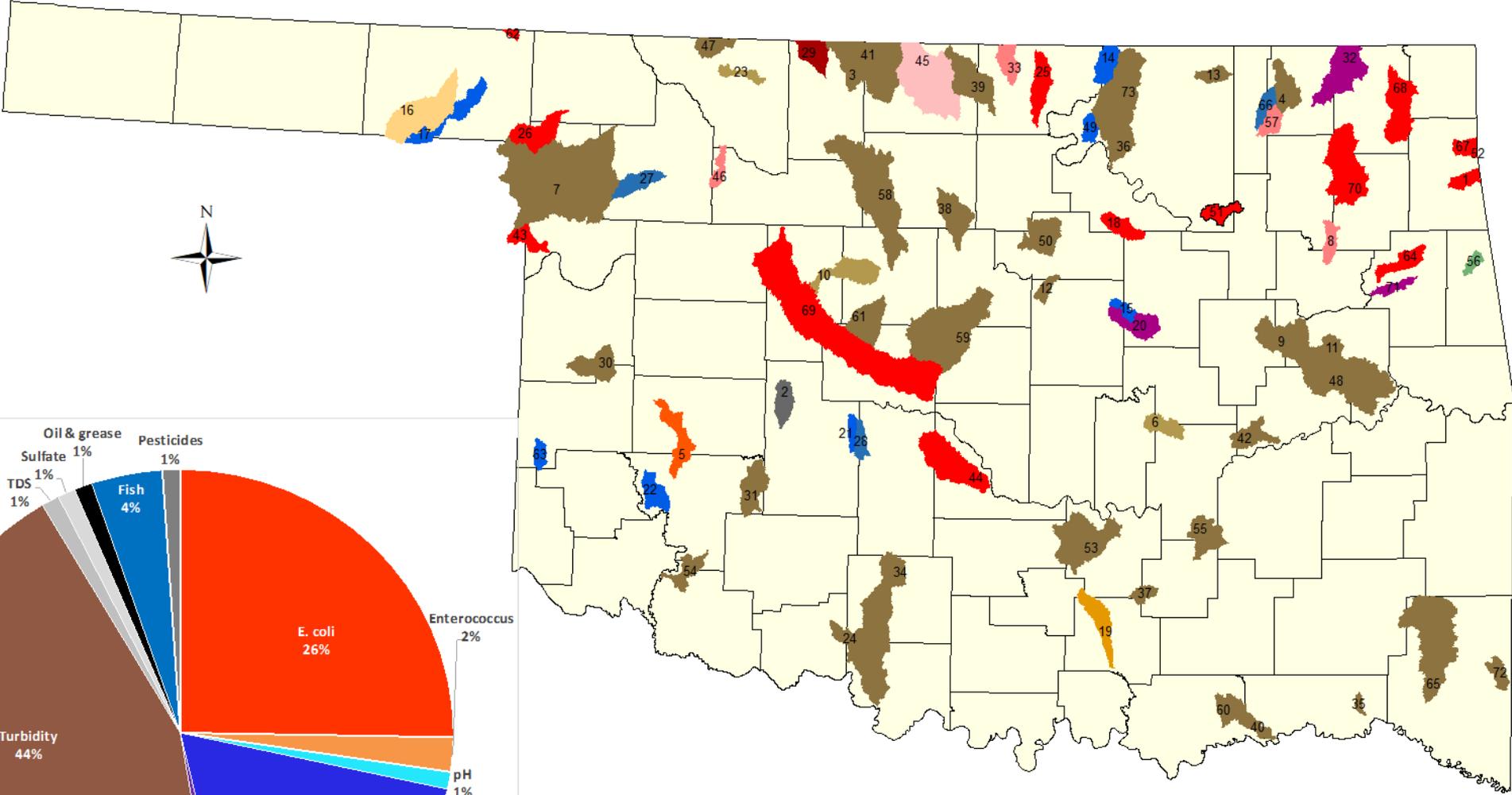
A Greener Landscape is A Cooler Landscape



How Much Water is Conservation Storing?

???????

Oklahoma 303(d) Listings/Nonpoint Source Success Stories



Questions?

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