

# State of the State's Waters

*35<sup>th</sup> Annual  
Governor's Water Conference  
October 22, 2014*

**J.D. Strong**  
OWRB Executive Director

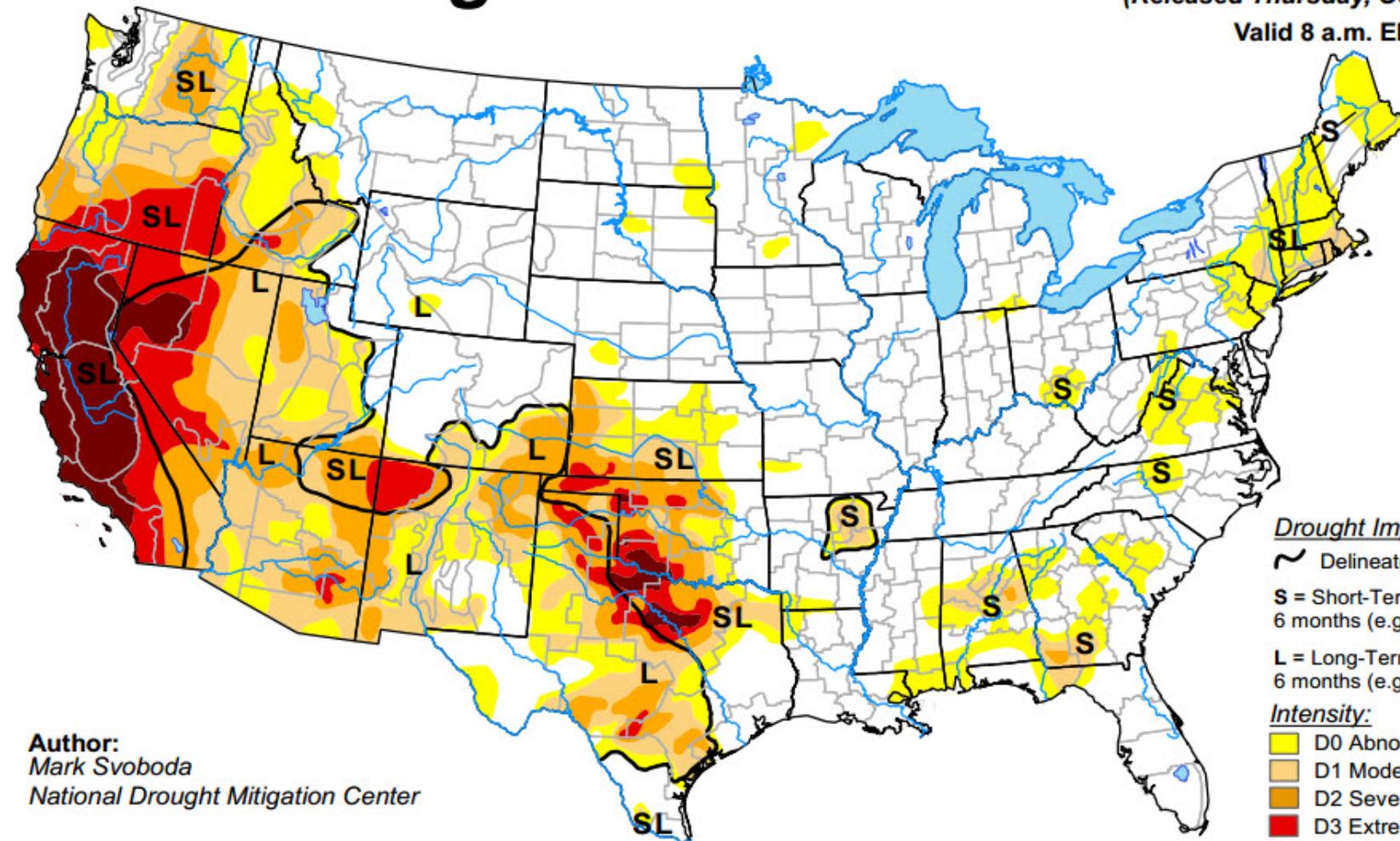


State of Oklahoma  
**OWRB**  
WATER RESOURCES BOARD  
the water agency

# U.S. Drought Monitor

October 14, 2014  
(Released Thursday, Oct. 16, 2014)

Valid 8 a.m. EDT



Author:  
Mark Svoboda  
National Drought Mitigation Center

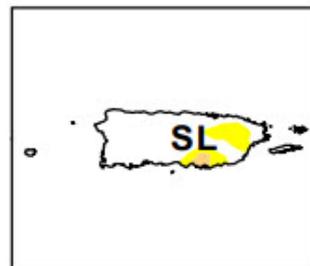
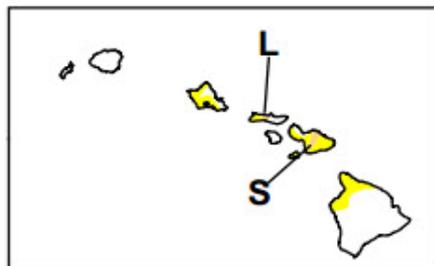
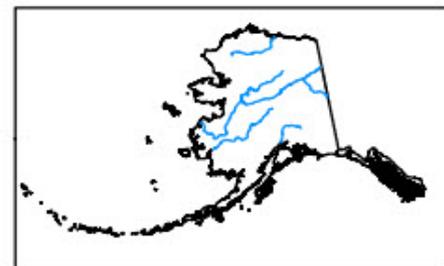
### Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

### Intensity:

- Yellow: D0 Abnormally Dry
- Light Orange: D1 Moderate Drought
- Dark Orange: D2 Severe Drought
- Red: D3 Extreme Drought
- Dark Red: D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



<http://droughtmonitor.unl.edu/>

# Top 10 U.S. Disasters\*

(damage in billions)

1980-2013

1. Hurricane Katrina (2005)	=	\$148.8
2. Drought (1988)	=	\$ 78.8
3. Sandy (2012)	=	\$ 65.7
4. Drought (1980)	=	\$ 56.4
5. Hurricane Andrew (1992)	=	\$ 44.8
6. Midwest Flooding (1993)	=	\$ 33.8
7. Drought (2012)	=	\$ 30.3
8. Hurricane Ike (2008)	=	\$ 29.2
9. Hurricane Wilma (2005)	=	\$ 19.0
10. Hurricane Rita (2005)	=	\$ 19.0

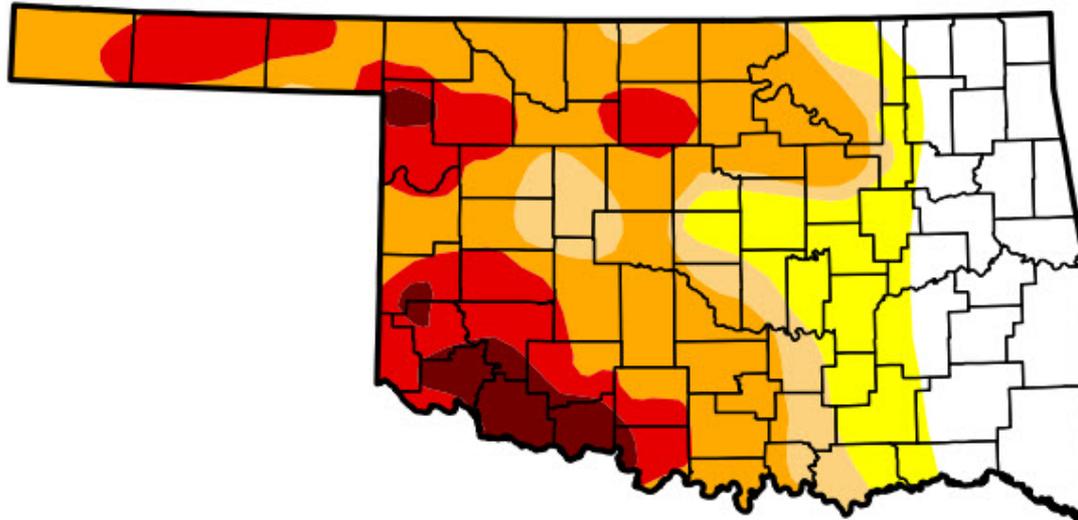
\*<http://www.ncdc.noaa.gov/billions>; cost adjusted to 2013 CPI

# U.S. Drought Monitor Oklahoma

**October 14, 2014**  
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Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	22.08	77.92	64.49	55.44	20.87	4.84
<b>Last Week</b> <i>10/7/2014</i>	8.55	91.45	73.44	58.20	21.00	4.84
<b>3 Months Ago</b> <i>7/15/2014</i>	9.86	90.14	79.57	62.93	29.37	6.43
<b>Start of Calendar Year</b> <i>12/31/2013</i>	50.84	49.16	38.17	18.99	4.84	2.40
<b>Start of Water Year</b> <i>9/30/2014</i>	8.55	91.45	73.31	58.13	20.92	4.64
<b>One Year Ago</b> <i>10/15/2013</i>	41.83	58.17	36.85	14.90	4.42	1.45



*Intensity:*



*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

**Author:**

Mark Svoboda

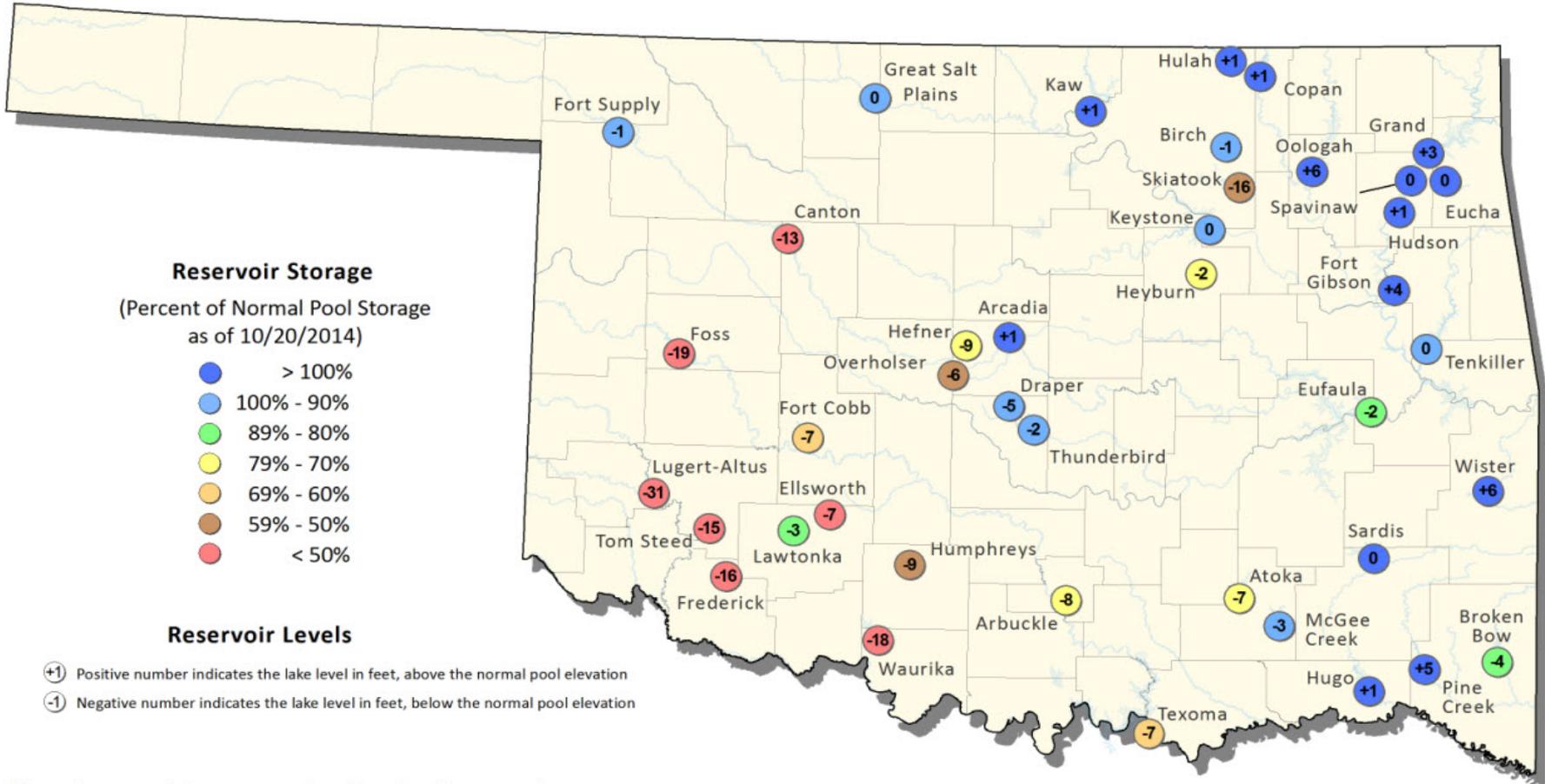
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

# Oklahoma Surface Water Resources

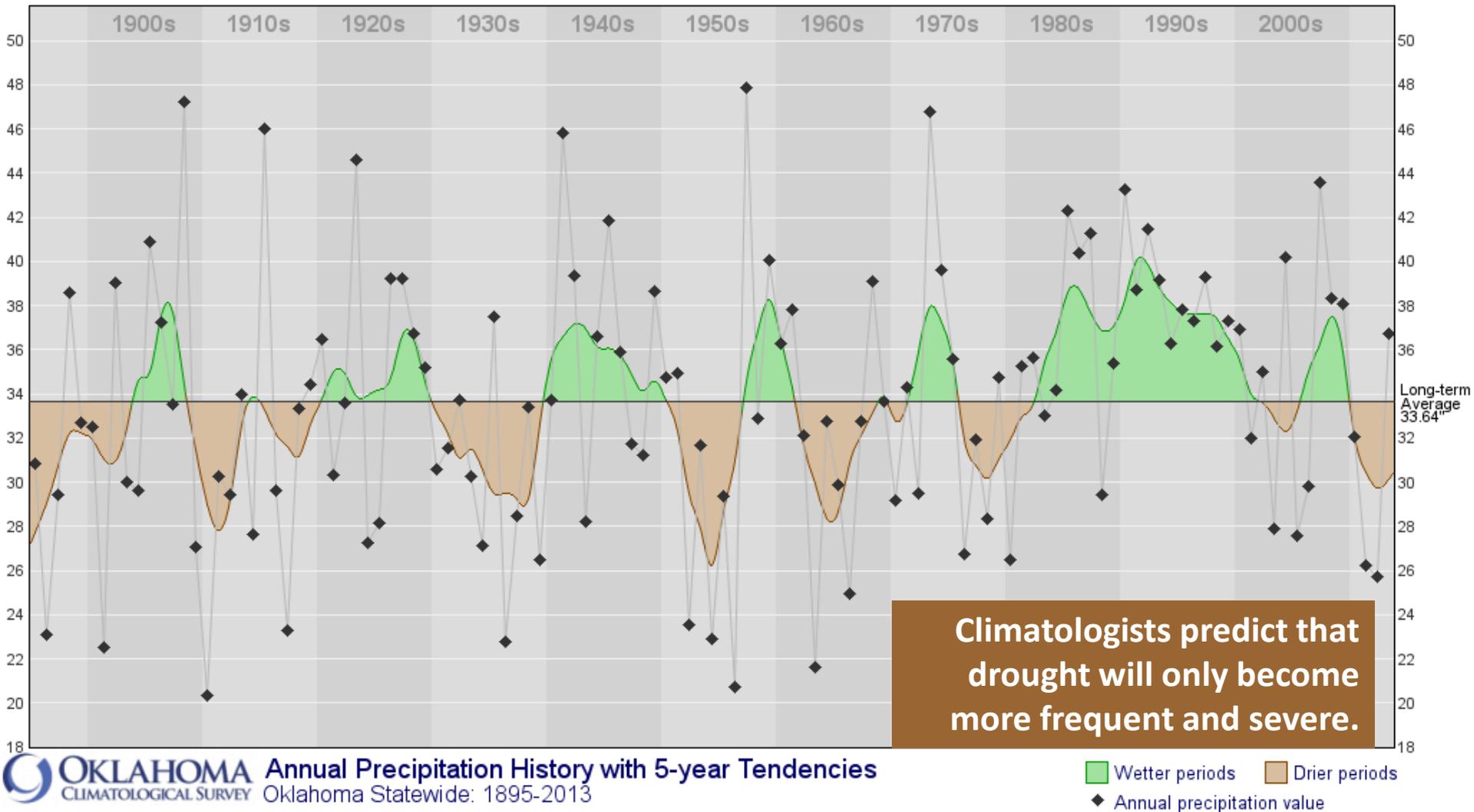
## Reservoir Levels and Storage as of 10/20/2014



This map shows reservoir storage as a percentage of normal pool storage capacity. The source information was collected from real-time lake gages monitored by the U.S. Army Corps of Engineers ([http://www.swt-wc.usace.army.mil/old\\_resv rept.htm](http://www.swt-wc.usace.army.mil/old_resv rept.htm)), and the U.S. Geological Survey ([http://waterdata.usgs.gov/ok/nwis/current/?type=lake&group\\_key=basin\\_cd](http://waterdata.usgs.gov/ok/nwis/current/?type=lake&group_key=basin_cd)) For more information please visit the OWRB's website at: (<http://www.owrb.ok.gov>)



# Oklahoma's Precipitation History



**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

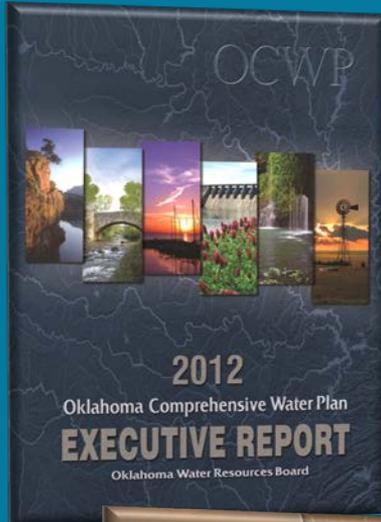
# Drought Conditions & Impacts in Oklahoma

Numerous water-related impacts to Agriculture, Water Systems, Industry, Navigation, Tourism, Recreation, etc.

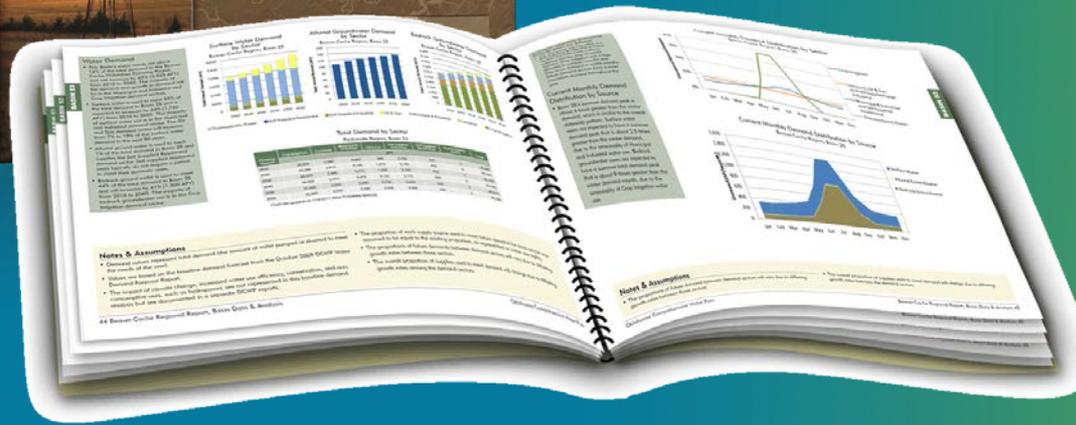
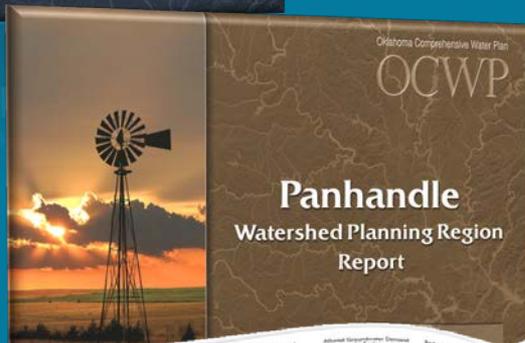
- Precipitation
- Streamflows
- Reservoir Levels
- Soil Moisture
- Fire Danger



# 2012 Update of the Oklahoma Comprehensive Water Plan



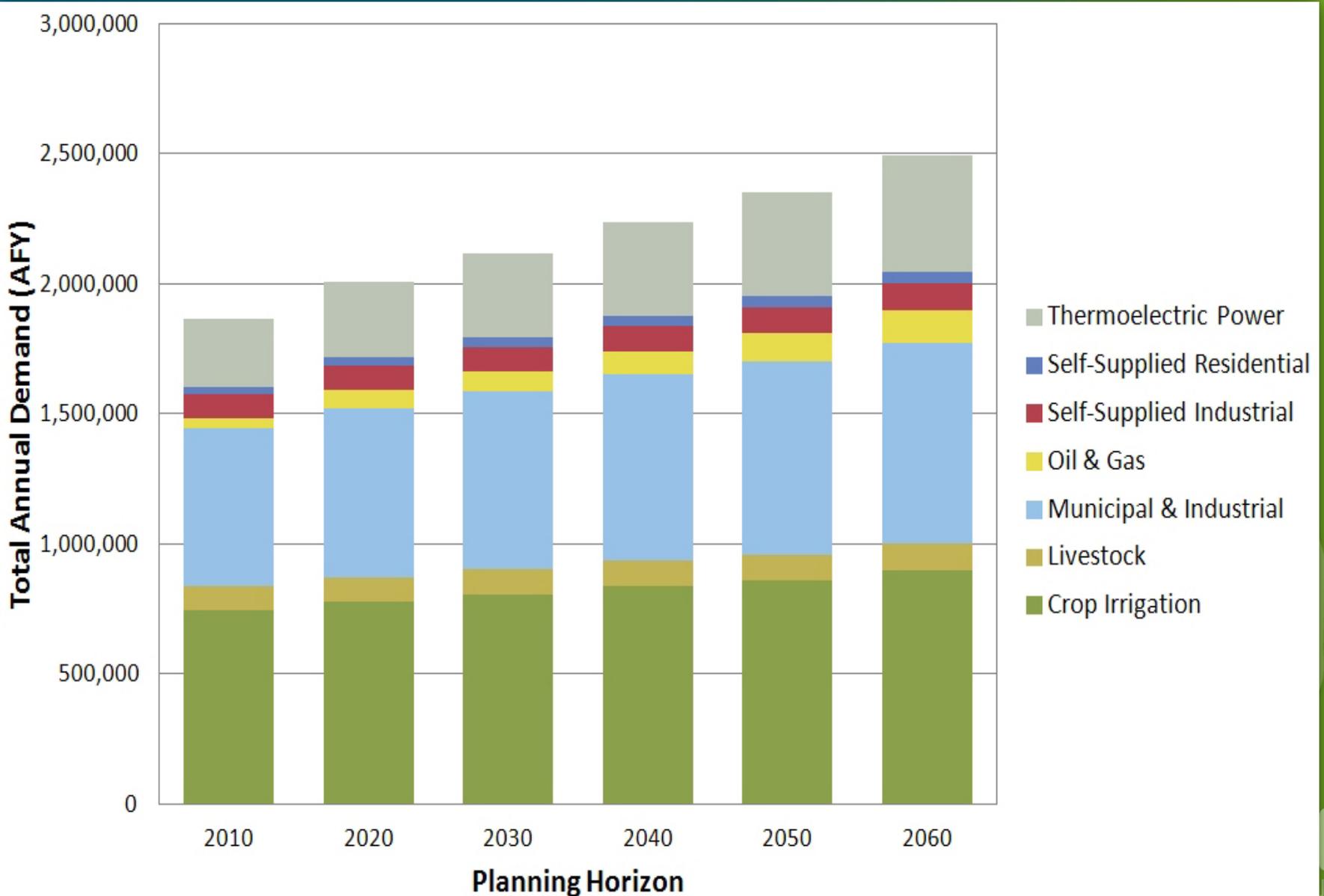
- Submitted to Governor and Legislature in 2012
- Most technically sound, extensively vetted Plan
- Executive Report & 13 Watershed Planning Region Reports



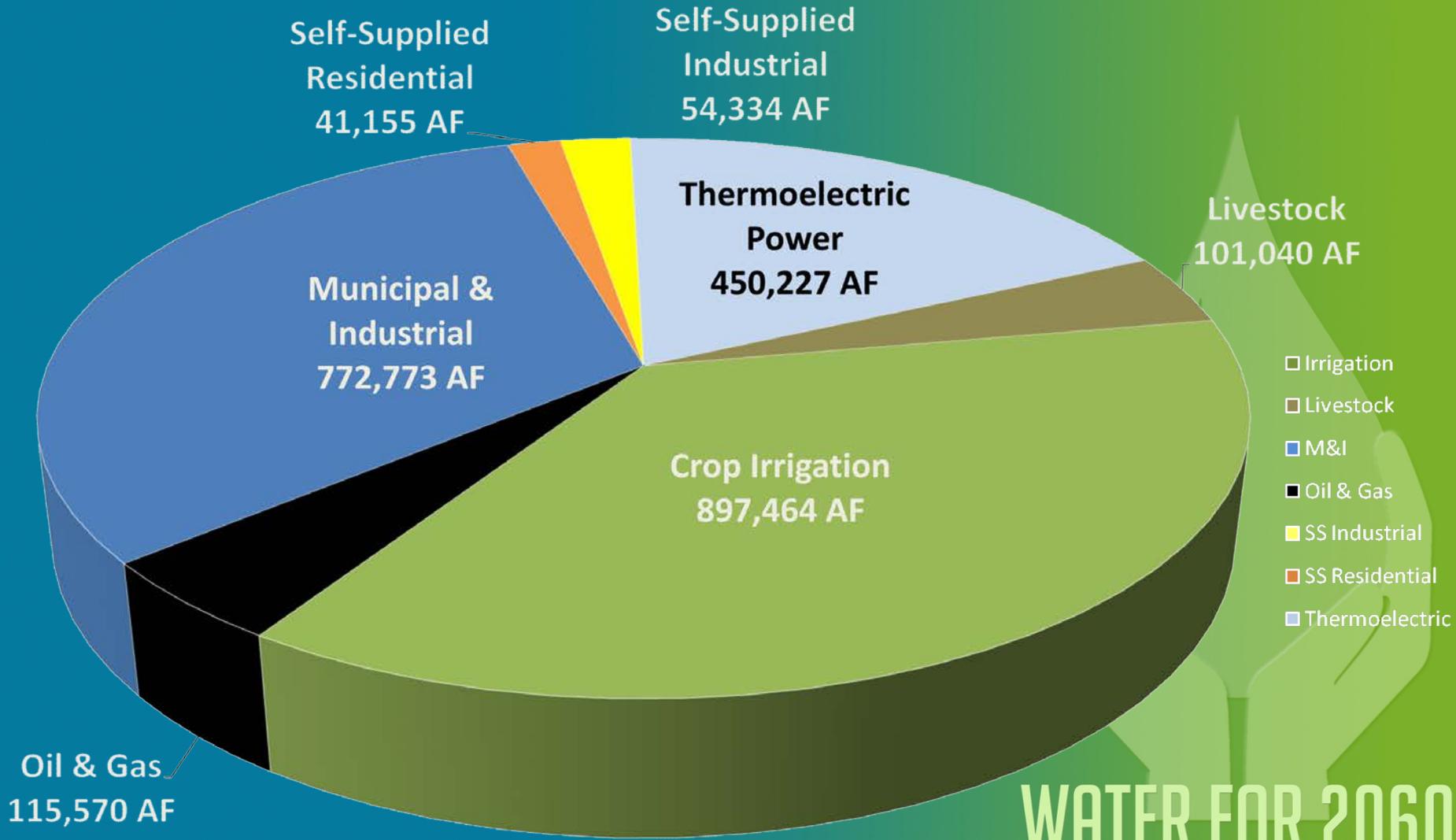
Overriding goal to provide safe, reliable water supplies to meet needs of all Oklahomans.

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# Total Water Demands (2010-2060)



# 2060 Statewide Water Demand



# OCWP - "Big 8" Priority Recommendations



Conservation, Reuse, Recycling



Infrastructure Financing



Monitoring



Supply Reliability



Fish & Recreation Flows



Regional Planning



Excess/Surplus



State/Tribal Resolution

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

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**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# Water for 2060 Signals a “Sea Change” in Oklahoma Water Management



Conservation  
& Efficiency



Drought  
Management

Every day, every year  
“way of life”

Actions we take in response  
to reduced supplies

Drought drives shortages

Conservation helps us prepare  
for drought and reduce impacts

WATER FOR 2060  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# Can We Do It?

Consuming no more fresh water in 2060 than we consume today... is achievable

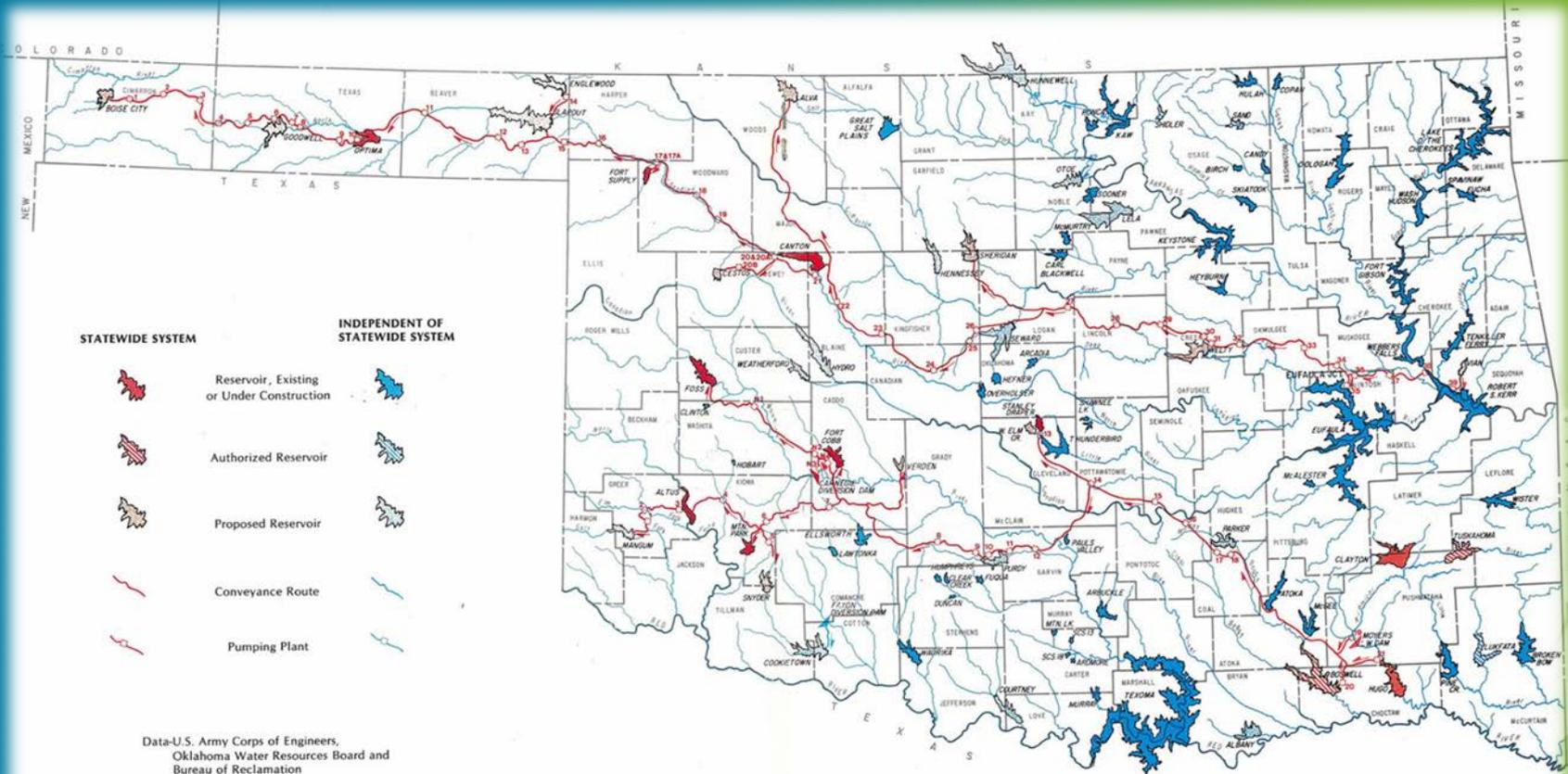


*OCWP Conservation Analysis*

M&I and Agriculture Statewide Demand Projections & Water Savings for Conservation Scenarios (AFY)						
	2010	2020	2030	2040	2050	2060
Baseline	<b>1,377,318</b>	1,455,309	1,523,273	1,587,406	1,642,069	1,711,392
Scenario I	N/A	1,301,816	1,332,781	1,388,603	1,435,807	<b>1,496,643</b>
Scenario II	N/A	1,155,397	1,170,248	1,209,372	1,244,123	<b>1,295,569</b>

# Innovative Solutions

## 1980 Water Plan



Data-U.S. Army Corps of Engineers,  
Oklahoma Water Resources Board and  
Bureau of Reclamation  
Mapping-Oklahoma Water Resources Board

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# Innovative Solutions

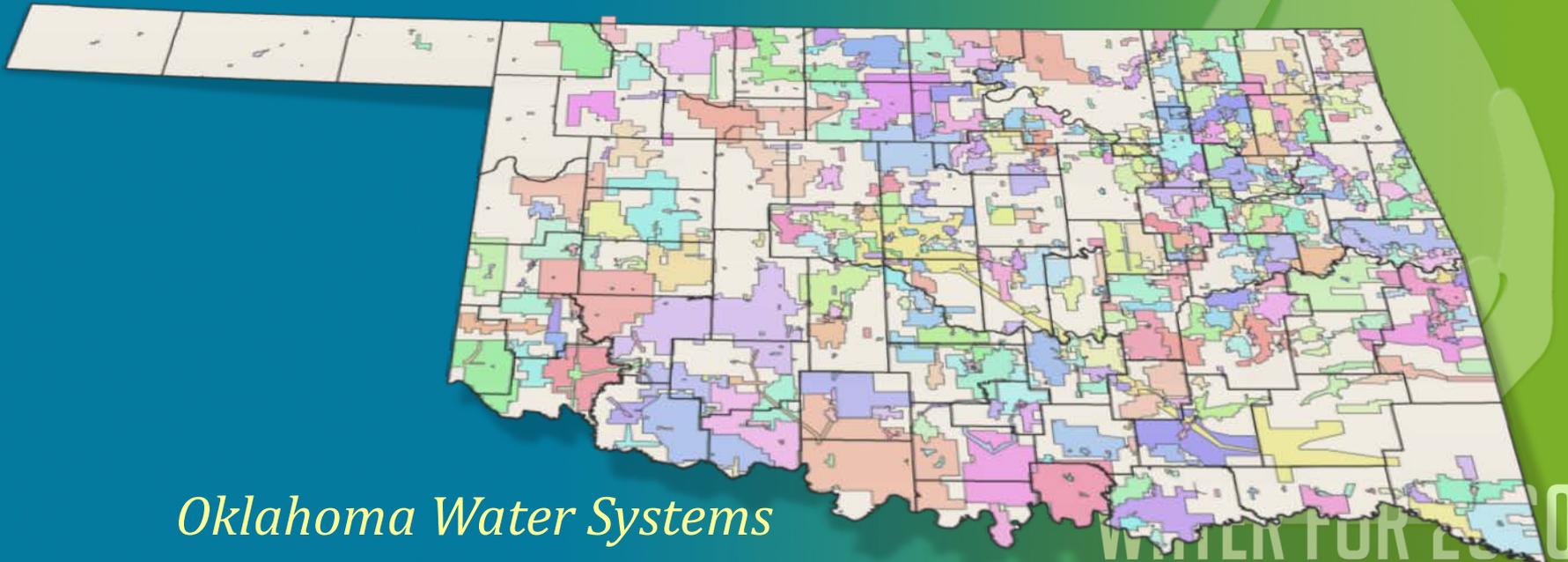
## Marginal Quality Water



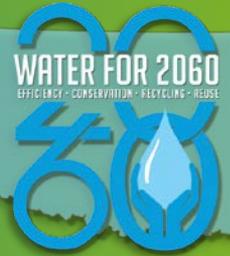
# Innovative Solutions

## Regionalization Options

- Oklahoma has ~700 water systems serving less than 1,000 customers
- Economy of scale benefits; systems with multiple sources more resistant to drought

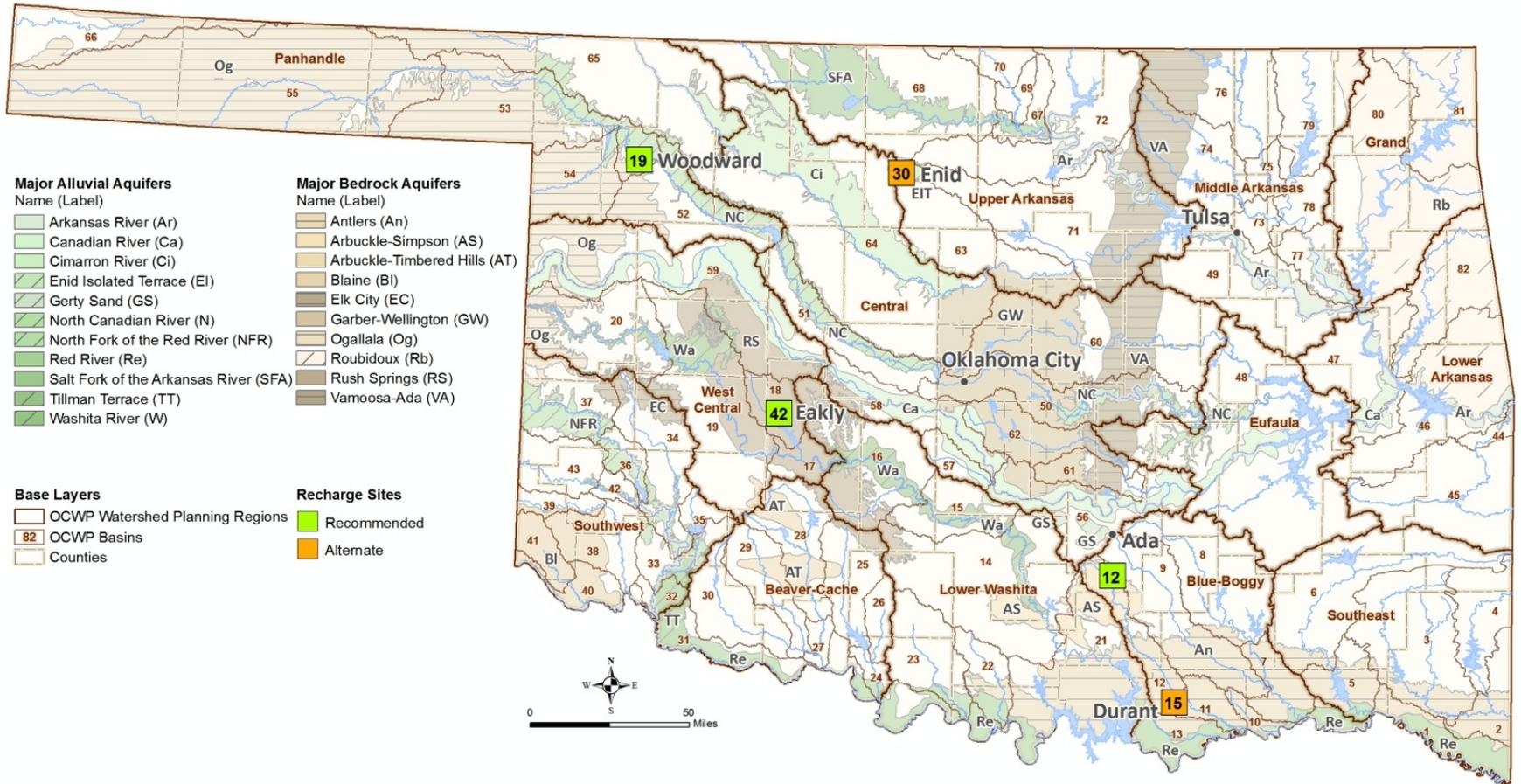


*Oklahoma Water Systems*



# Innovative Solutions

## Potential Artificial Aquifer Recharge Sites

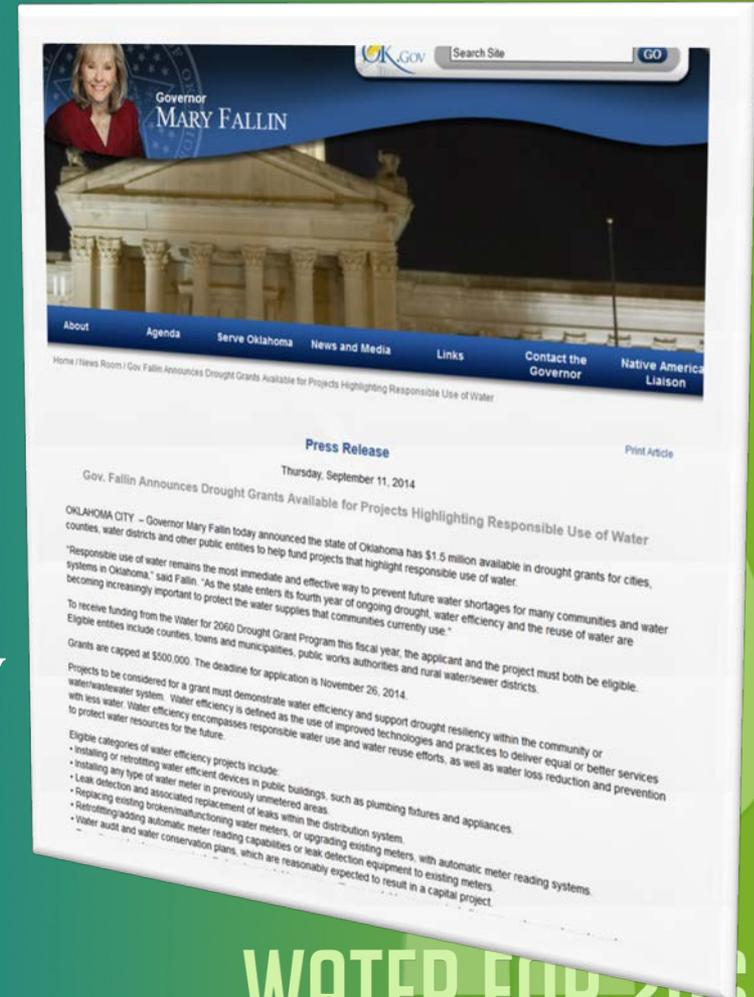


# Innovative Solutions

## Water for 2060 Drought Grants



- FY 2014 supplemental appropriation of \$1.5 million for drought grants
- Gov. Fallin announced availability on Sep. 11<sup>th</sup>
- Focus on responsible use of water
- Promote greater water efficiency AND drought resiliency
- **November 26, 2014 application deadline**



**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

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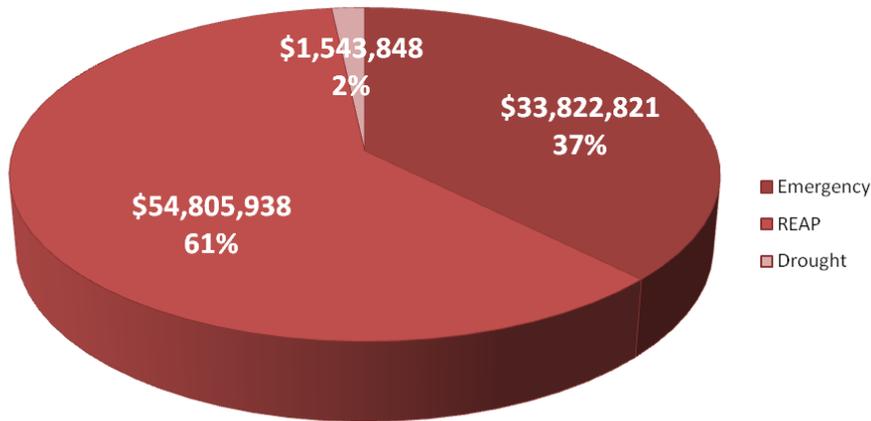
**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# 2012 Update of the OCWP

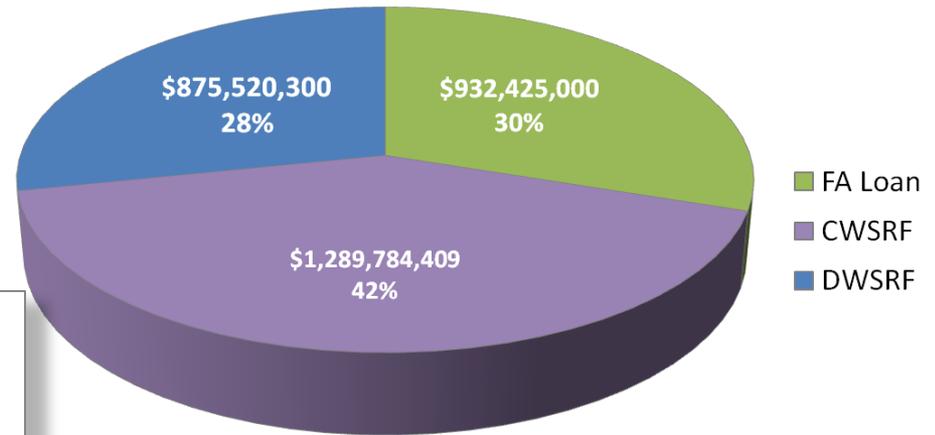
## Infrastructure Funding To-Date

Over \$3 billion in loan and grants to date; **savings over \$1 billion**

Grant Programs - Approved Funding



Loan Programs - Approved Funding



APPROVED FINANCING BY PURPOSE

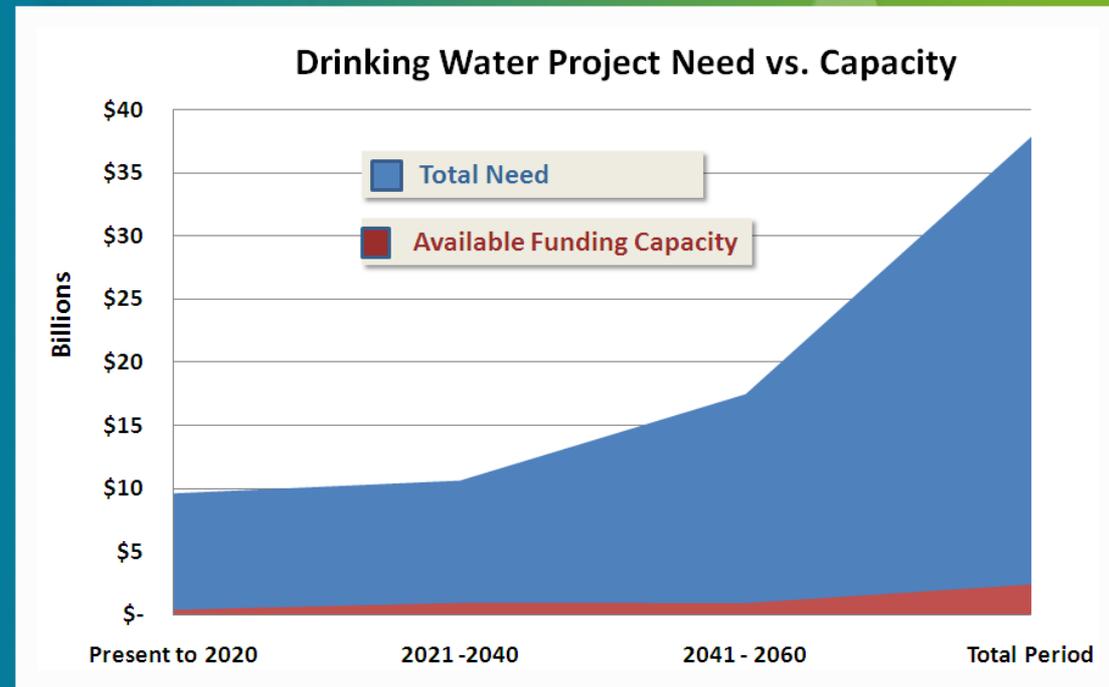
Purpose	Number	Approved Amount
Water	1,269	\$1,552,410,928
Sewer	698	\$1,436,366,086
Other	46	\$199,125,303
<b>TOTAL</b>	<b>2,013</b>	<b>\$3,187,902,316</b>

# 2012 Update of the OCWP

## Infrastructure Funding

OCWP  
Priority

- Address Oklahoma's projected \$82+ billion water and wastewater infrastructure need by 2060
- OWRB's successful ("AAA") loan & grant programs can only satisfy 4-9% of this need



# 2012 Update of the OCWP Infrastructure Funding

OCWP  
Priority

SQ 764 (57%Y -43%N)

Water Infrastructure Credit  
Enhancement Reserve Fund

STANDARD  
& POOR'S  
RATINGS SERVICES

RatingsDirect®

Oklahoma Water Resources  
State Revolving Fund

Primary Credit Analyst:  
James M. Breeding, Dallas (1) 214-471-1407 jmb  
Secondary Contact:  
Scott D. Garrigan, Chicago (1) 312-235-7914

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Rationale  
Outlook  
Enterprise Risk Profile  
Financial Risk Profile  
Financial Policies And  
Related Criteria A

## Oklahoma Water Resources Board; State Revolving Funds/ Pools

### Credit Profile

Oklahoma Wtr Resources Brd  
Long Term Rating

AAA/Stable

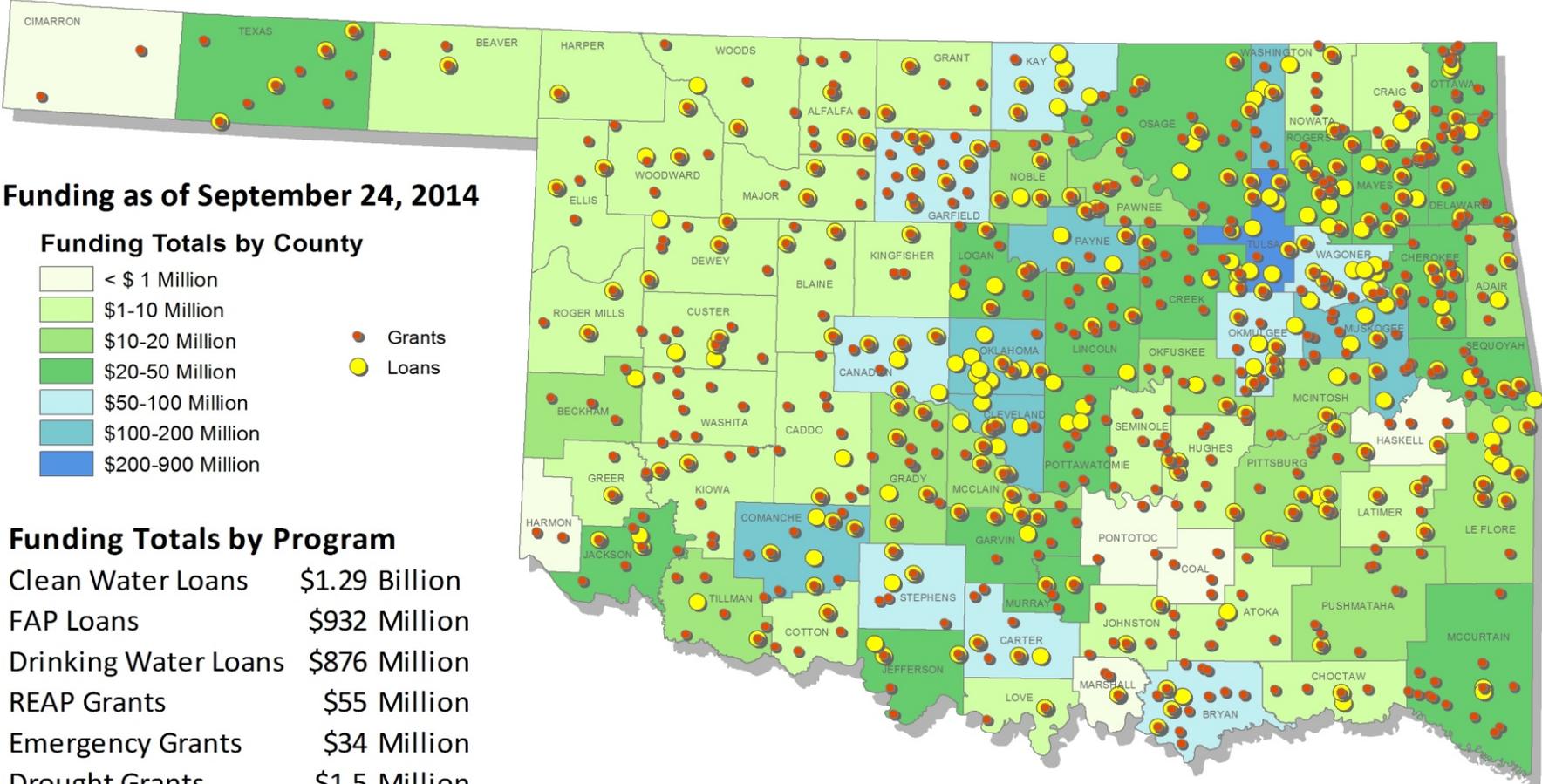
Upgraded

### Rationale

Standard & Poor's Ratings Services has raised its rating on Oklahoma Water Resources Board's (OWRB) state loan program revenue bonds to 'AAA' from 'AA+'. The upgrade reflects the board's access to the newly created Water Infrastructure Credit Enhancement Reserve Fund (WICERF). The board now has the ability to issue bonds supported by a state general obligation (GO) pledge in an amount up to \$300 million. This additional support effectively lowers the financial risk score assigned to the state loan program and allows for Standard & Poor's to raise the rating to 'AAA'. The ability to issue state GO bonds is contingent on Oklahoma retaining strong market access. With the high current rating on the state, we do not believe this is a concern; however, should Oklahoma's access to the bond market become less certain, the enhancement provided by access to the WICERF could be diminished.

# Financial Assistance Program

## Loan and Grant Recipient Status



**Funding Totals by Program**

Clean Water Loans	\$1.29 Billion
FAP Loans	\$932 Million
Drinking Water Loans	\$876 Million
REAP Grants	\$55 Million
Emergency Grants	\$34 Million
Drought Grants	\$1.5 Million
<b>TOTAL</b>	<b>\$3.19 Billion</b>
<b>TOTAL SAVINGS</b>	<b>\$1 Billion</b>

# OCWP - "Big 8" Priority Recommendations



Conservation, Reuse, Recycling



Infrastructure Financing



Monitoring



Supply Reliability



Fish & Recreation Flows



Regional Planning



Excess/Surplus



State/Tribal Resolution

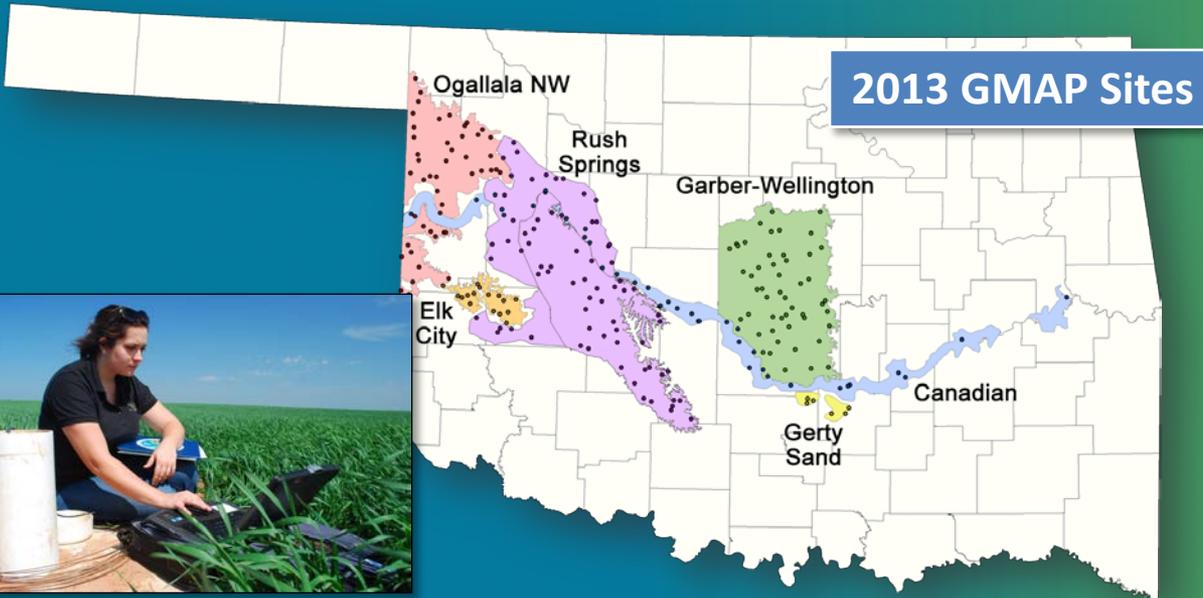
**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# 2012 Update of the OCWP

## Monitoring



- Better data for improved decision-making
- \$1.5 M/yr for statewide water quality and quantity monitoring program
- Create the first comprehensive groundwater monitoring program (“GMAP”)





# OCWP - "Big 8" Priority Recommendations



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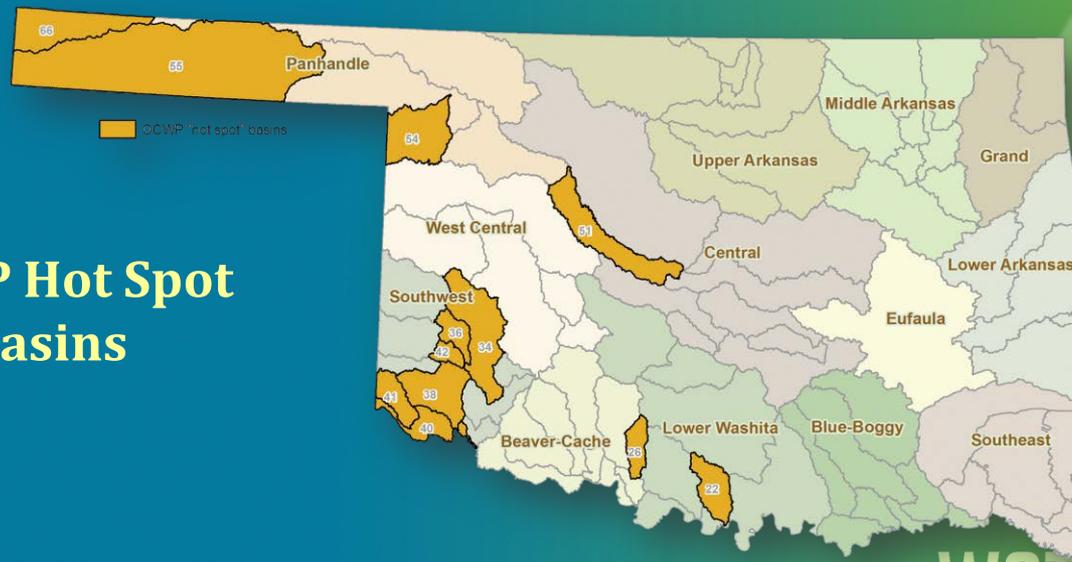
# 2012 Update of the OCWP

## Water Supply Reliability

OCWP  
Priority

- Ensure water availability for future growth through fair and sustainable water allocation
- Utilization of \$1.3 M/yr Gross Production Tax for groundwater basin/watershed allocation models

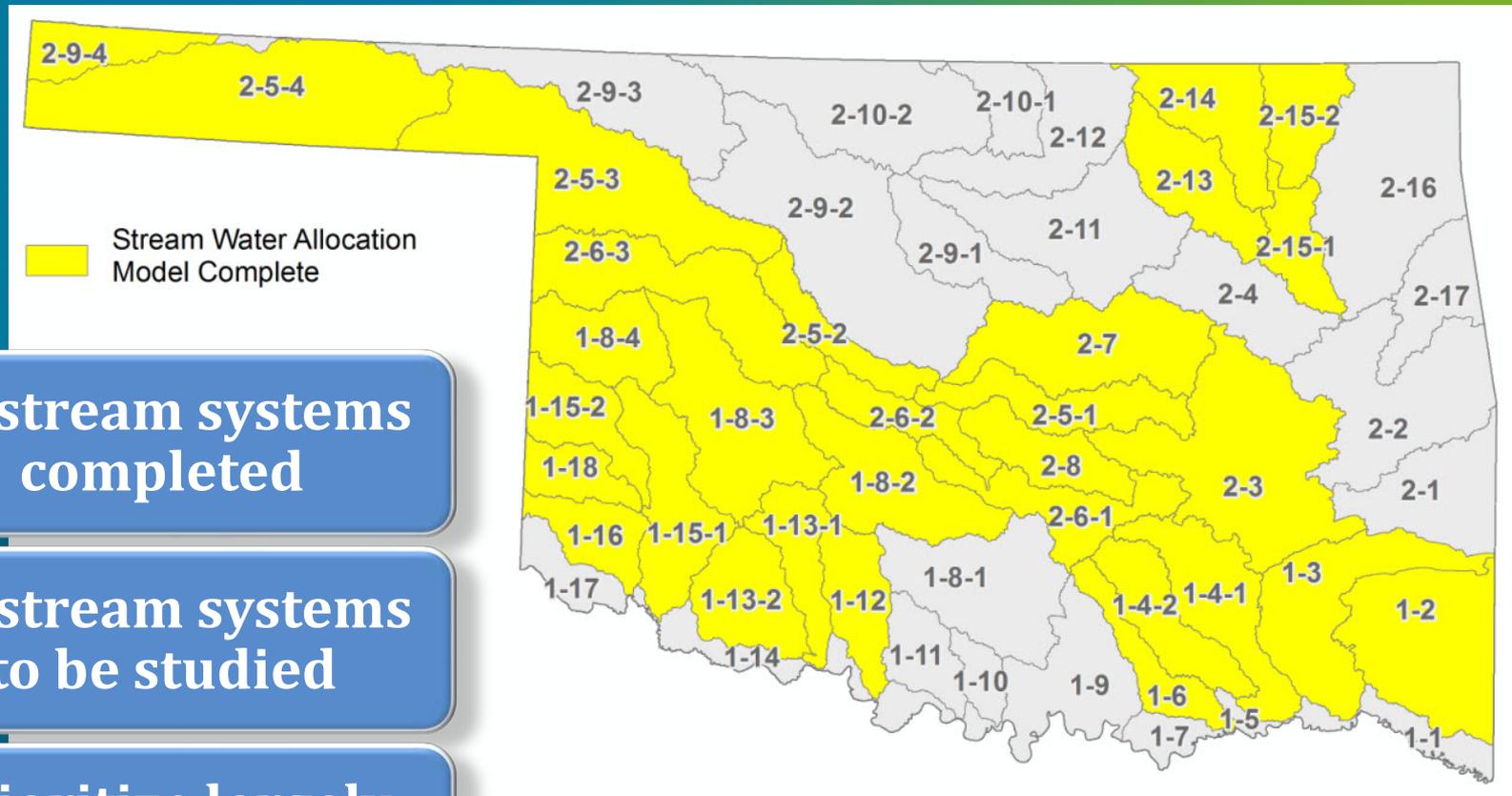
### OCWP Hot Spot Basins



WATER FOR 2060  
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# Stream Water Allocation Models

- Complete all unstudied and overdue GW basins by 2022



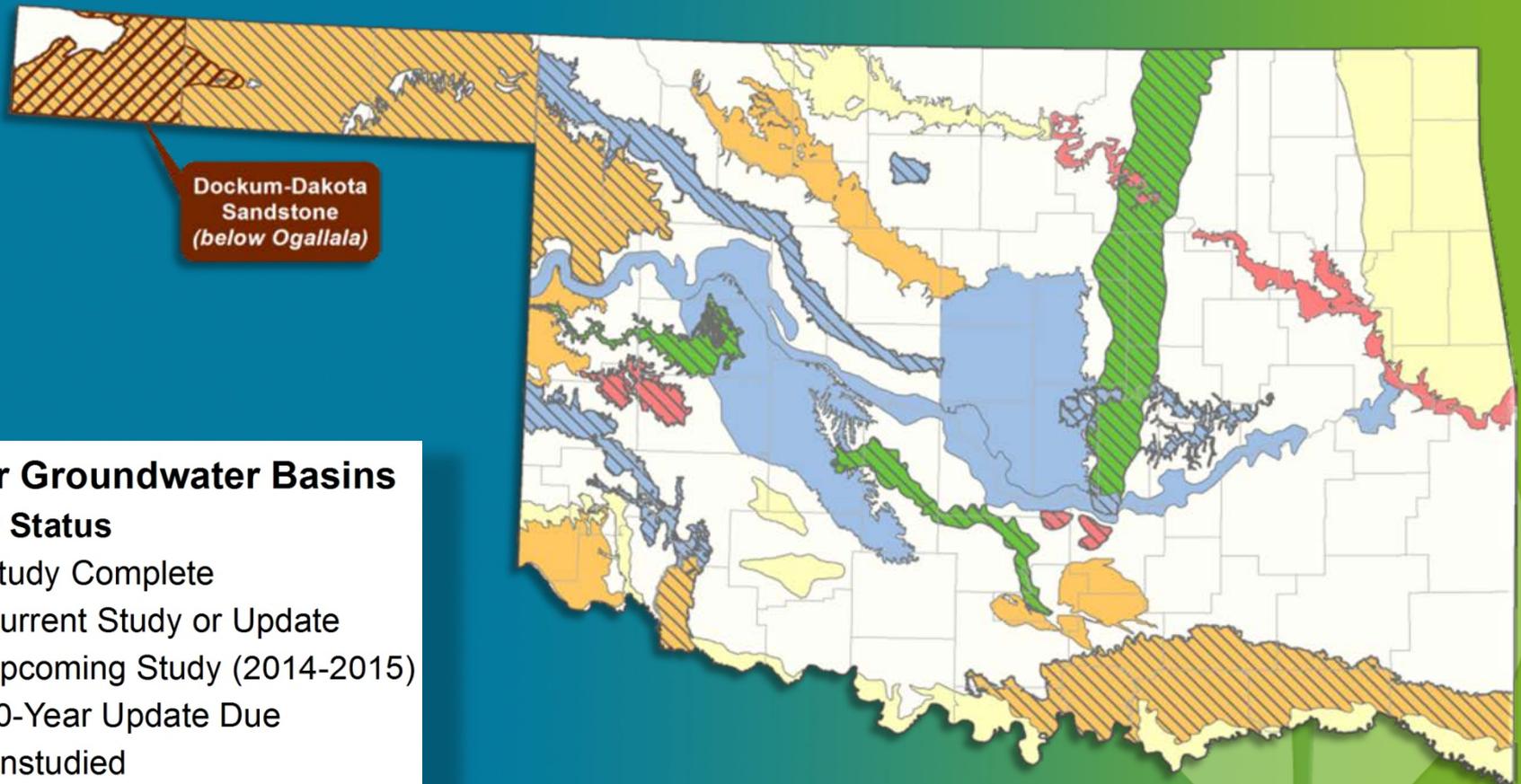
14 stream systems completed

36 stream systems to be studied

Prioritize largely allocated systems

# Major Groundwater Basin Studies

- Complete all unstudied and overdue GW basins by 2022



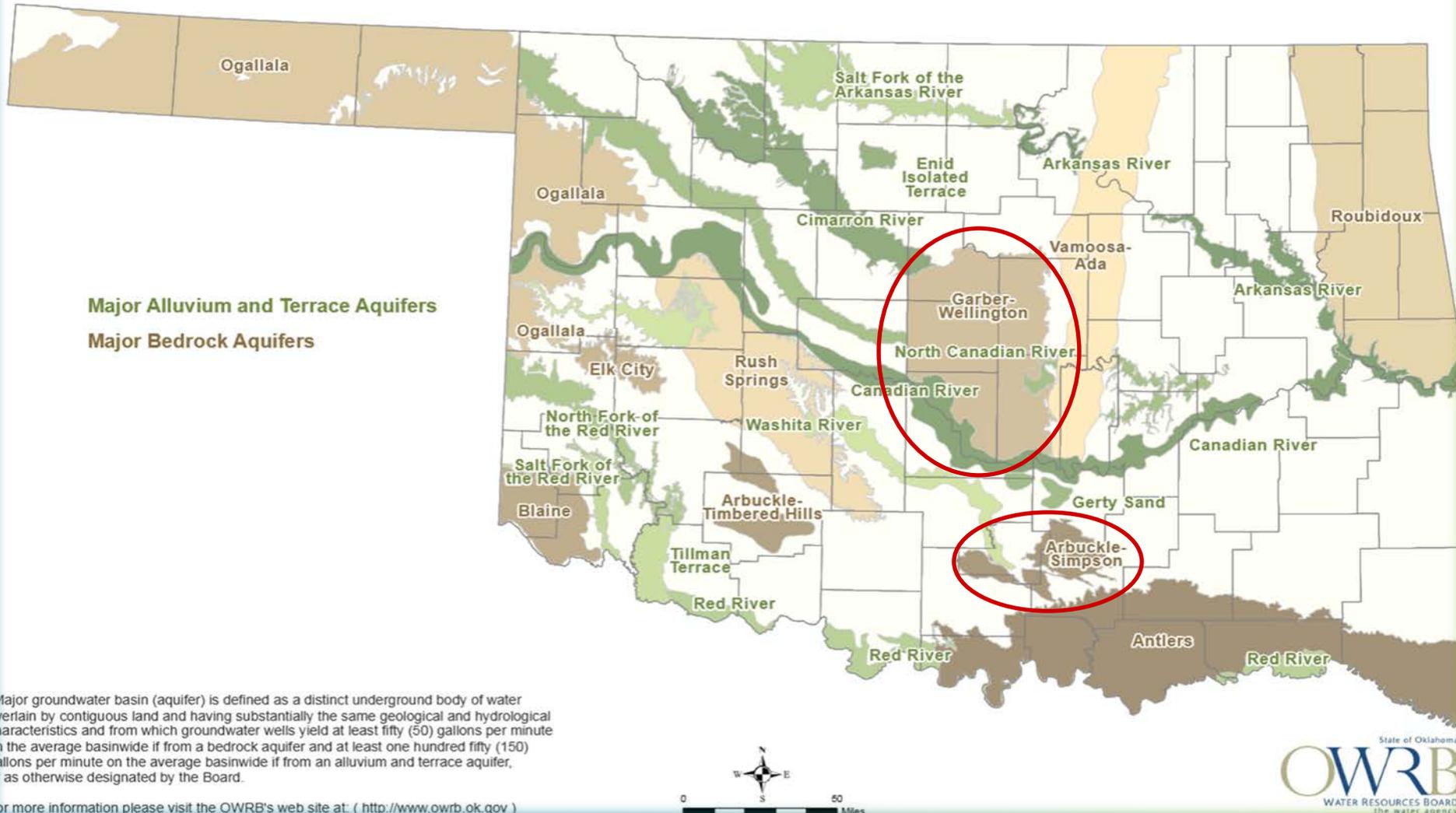
## Major Groundwater Basins

### Study Status

- Study Complete
- Current Study or Update
- Upcoming Study (2014-2015)
- 20-Year Update Due
- Unstudied
- Max Annual Yield Determined

# Recent Studies

## Oklahoma Groundwater Resources Major Aquifers of Oklahoma



\*Major groundwater basin (aquifer) is defined as a distinct underground body of water overlain by contiguous land and having substantially the same geological and hydrological characteristics and from which groundwater wells yield at least fifty (50) gallons per minute on the average basinwide if from a bedrock aquifer and at least one hundred fifty (150) gallons per minute on the average basinwide if from an alluvium and terrace aquifer, or as otherwise designated by the Board.

For more information please visit the OWRB's web site at: (<http://www.owrb.ok.gov>)

# OCWP - "Big 8" Priority Recommendations



Conservation, Reuse, Recycling



Infrastructure Financing



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Excess/Surplus



State/Tribal Resolution

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# 2012 Update of the OCWP

## Fish & Recreation Flows

OCWP  
Priority

- Recognize nonconsumptive water needs and **supporting recreational and local economic interests.**
- Assess the suitability and structure of a potential instream flow program for Oklahoma.



**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

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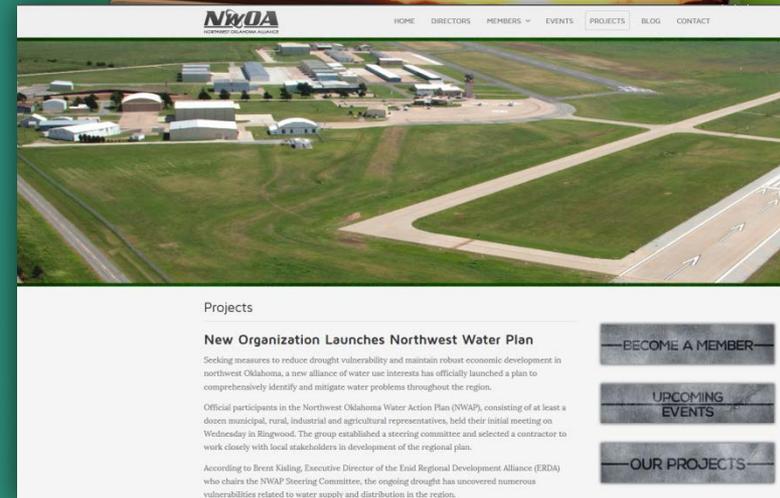
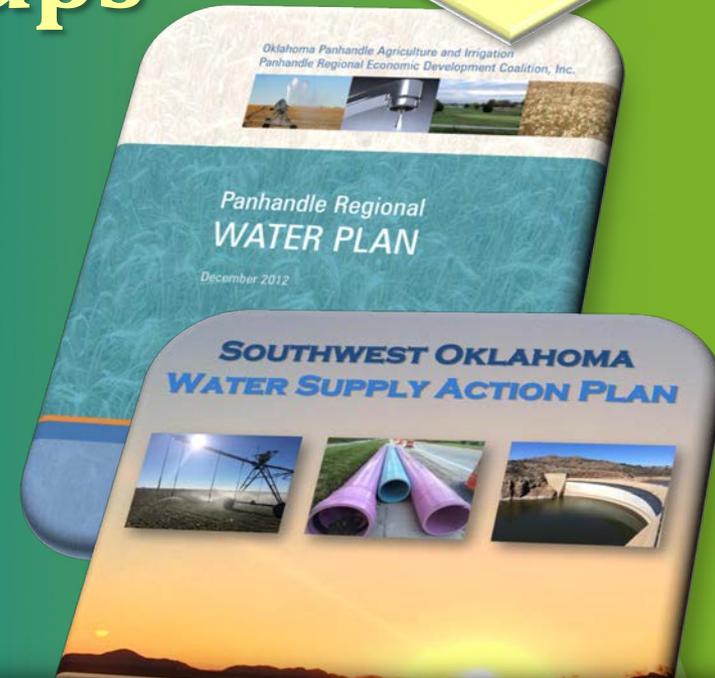
State/Tribal Resolution

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# 2012 Update of the OCWP Regional Planning Groups

OCWP  
Priority

- Most popular recommendation
- “Bottom-up” water planning
- **Non-regulatory** to assist in planning and implementing OCWP initiatives at the regional level
- Consist of local stakeholders representing unique interests of each region
- Happening organically now?



# OCWP - "Big 8" Priority Recommendations



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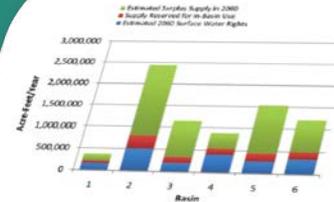
# 2012 Update of the OCWP Excess & Surplus

OCWP  
Priority

- Protect local water needs while addressing statewide demands.
- Definition and procedure required by statute.
- Ensure that the area of origin (planning basins) will never be made water deficient.

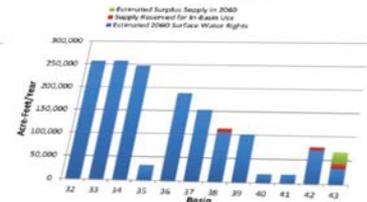
Estimated Surface Water Surplus in 2060

Southeast Region

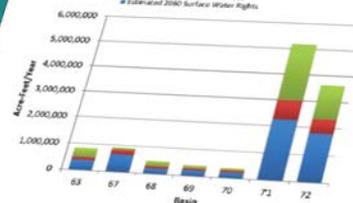


Estimated Surface Water Surplus in 2060

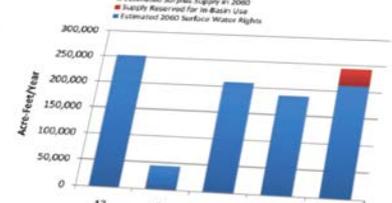
Southwest Region



Estimated Surface Water Surplus in 2060  
Upper Arkansas Region



Estimated Surface Water Surplus in 2060  
West Central Region



### Groundwater Permit Availability

The permit availability of groundwater was determined for each of the 82 OCWP basins, including areas with and without studied groundwater basins. Two major types of groundwater permits are issued by the OWRB—regular and temporary. Regular groundwater permits are issued for aquifers that have been studied, a maximum annual yield (MAY) determined, and an equal proportionate share (EPS) approved. An EPS is the portion of maximum annual yield of groundwater in a given groundwater basin allocated to each acre of overlying land. Current EPS vary from 0.5 to 2.1 AFY per acre. In all areas with no defined EPS, a temporary permit of 2.0 AFY per acre may be issued.

To calculate the maximum amount of groundwater available for permits, the geographical area of any underlying aquifers was determined for each basin. Since the OCWP basins were defined based on surface watersheds, Oklahoma's aquifers typically span multiple OCWP basins. For the groundwater

permit availability analysis, the identified aquifers with EPS determinations had their respective EPS applied and for those basins without an EPS, 2 AF per surface acre (temporary) was applied. The total permit availability was determined by summing the EPS and temporary withdrawal volumes. Current (2007) permit availability was estimated by subtracting the existing active groundwater rights from the total permit availability. Since forfeiture of existing groundwater rights is rare, all existing active rights were used to conservatively represent the current portion of each basin that is not available for permits.

The quantity of groundwater that would need to be permitted by 2060 was estimated for each OCWP basin by summing the existing active groundwater rights and the increase in projected groundwater demand from 2007 to 2060. Demand increases were calculated using current (2007) surface water and groundwater supply proportions in each OCWP basin. A groundwater permit gap was estimated for the present (2010)

60 Executive Report

Oklahoma Comprehensive Water Plan

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# OCWP - "Big 8" Priority Recommendations



Conservation, Reuse, Recycling



Infrastructure Financing



Monitoring



Supply Reliability



Fish & Recreation Flows



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Excess/Surplus



State/Tribal Resolution

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

# 2012 Update of the OCWP State/Tribal Consultation

OCWP  
Priority

- Build cooperation to **avoid future conflict** and remove uncertainties to water use.
- Governor, State Legislature & Tribes should **make formal consultation a high priority.**



## Water Rights Task Force formed to develop water plan for the Osage Nation

By Shannon Shaw Duty

Date: March 13, 2013

Share:

A Water Rights Task Force made up of members from the Osage Congress, the Chief's Office and employees of the Nation is working on developing a water plan for the Nation.

The task force, chaired by Congressman Geoffrey Standing Bear, is made up of Congressman Daniel Boone, Congresswoman Maria Whitehorn, Executive Adviser to the Principal Chief Debra Alterberry, ON Attorney General Jeff Jones, Asst. AG Clint Patterson, Osage Minerals Councilman Andrew Yates, Environmental and Natural Resources Director Jann Jones, ENR employee Matt Allen and Strategic Planning and Grants Management Director Jennifer Tiger.

To date the task force has visited the Citizen Potawatomi Nation to speak with officials on how they created their water plan.

A company out of Houston, Texas, Select Energy Services, LLC, approached the Nation on developing a water plan. According to Businessweek.com, Select Energy Services "provides water solutions and well-site services to energy producers in North America. It offers water sourcing, water transfer, containment, well testing, water treatment, fluid handling, and disposal services. The company also provides well site construction, field services, pipeline construction."



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BLOGS

LIF

## Tribal water rights claims complicate Oklahoma's water planning efforts

0  
comments

Oklahoma's pre-statehood history as a relocation territory for American Indian tribes has created a legal labyrinth for anyone trying to determine water rights to streams and reservoirs in the state.

BY RANDY ELLIS [rellis@opubco.com](mailto:rellis@opubco.com) • Published: June 5, 2011

Negotiate or battle it out through the legal system.

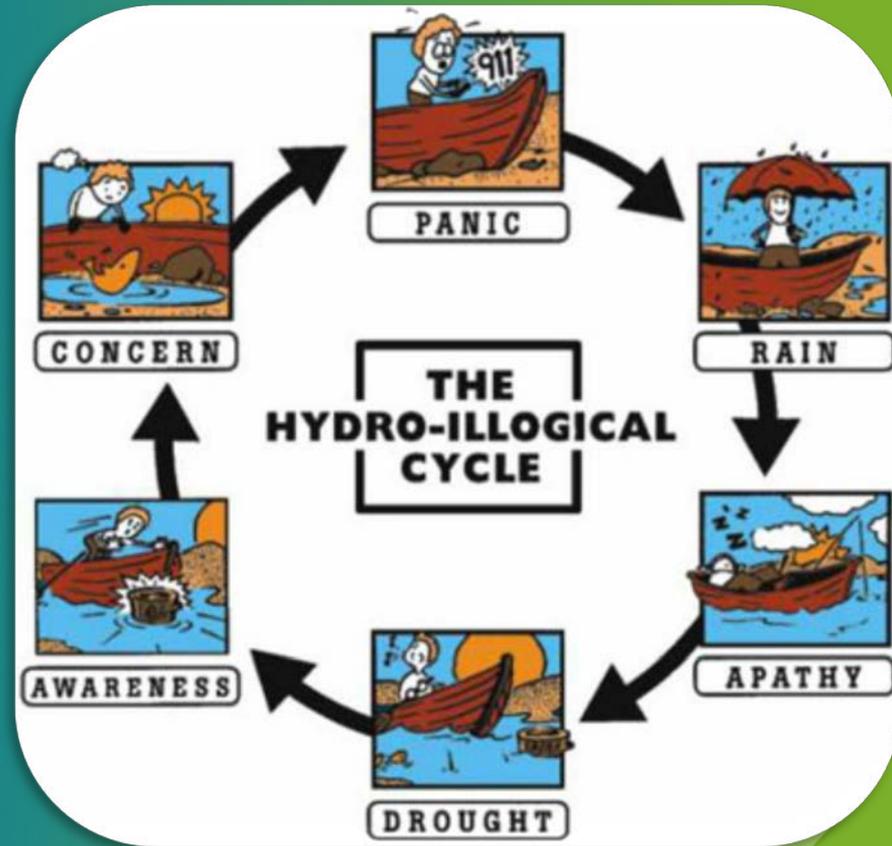
That's the dilemma facing Oklahoma political leaders and American Indian tribes when it comes to resolving conflicting water rights claims.

Today  
do more of  
what you  
love.



# Hydro-LOGICAL Cycle

- **Plan** ahead, and plan for the worst
- **Conserve** as if we're always in drought
- **Reuse/recycle** as much as possible
- **Innovate** – look for alternatives to freshwater for meeting every need
- **Minimize cost**, both fiscal and political



© National Drought Mitigation Center

**WATER FOR 2060**  
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

State of Oklahoma

# OWRB

WATER RESOURCES BOARD  
the water agency



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