36th Annual Oklahoma Governor's Water Conference and Research Symposium

Tuesday & Wednesday, December 1st & 2nd
at the Embassy Suites in Norman, Oklahoma

J. D. Strong

OWRB Executive Director

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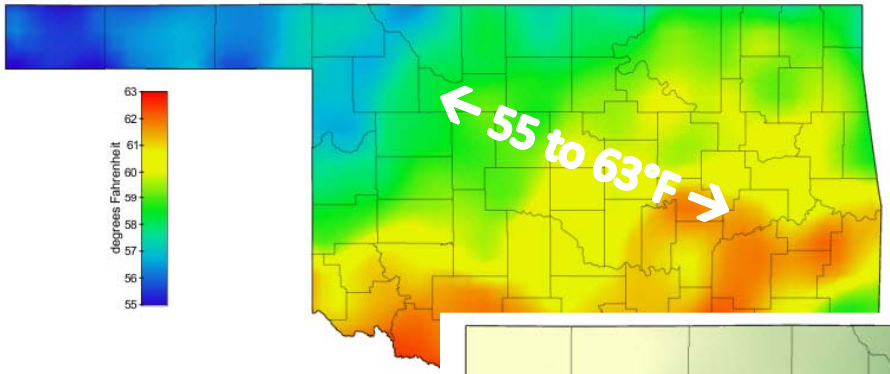
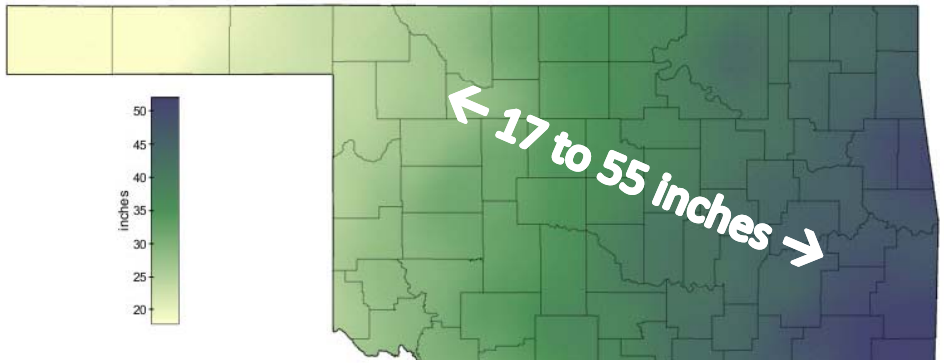
Oklahoma's Diverse Climate

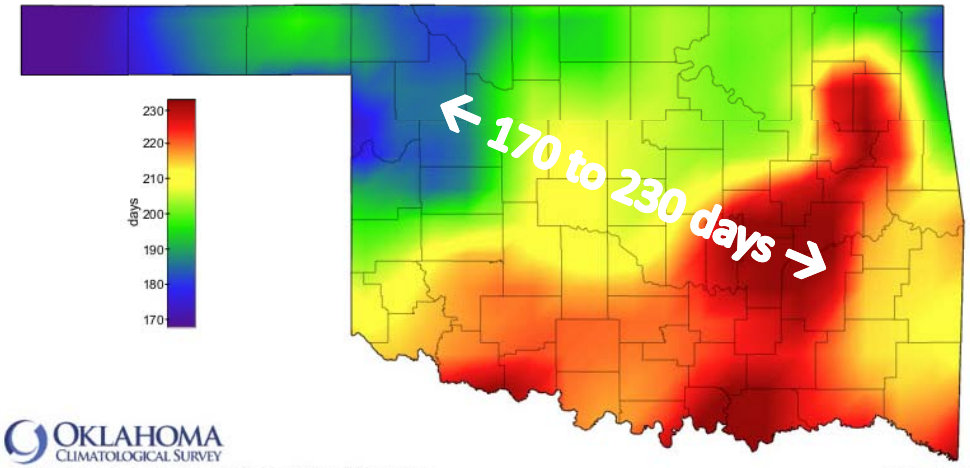


OKLAHOMA CLIMATOLOGICAL SURVEY
Normal Annual Temperature

Extremes: -27 to 120°F



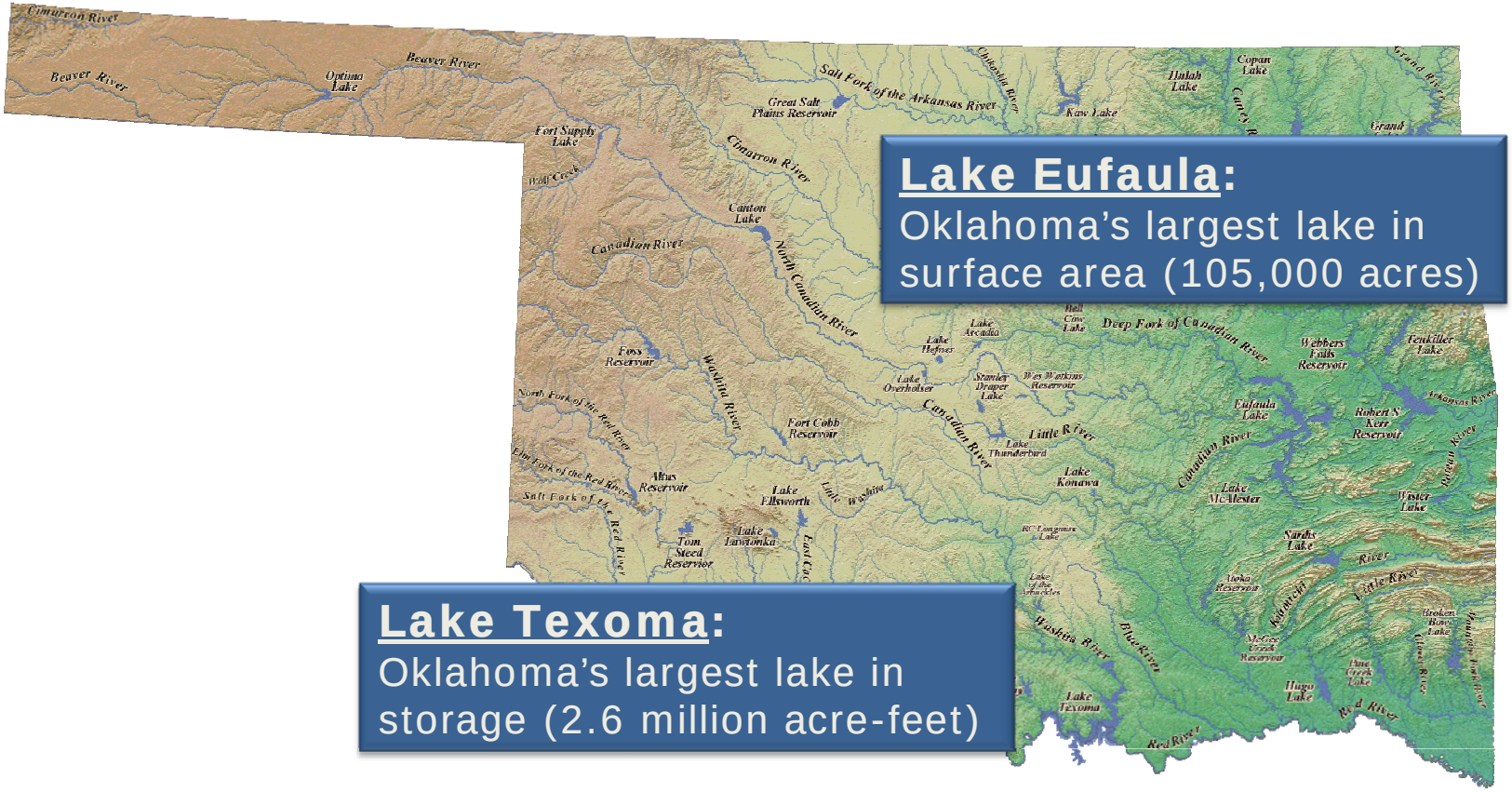
OKLAHOMA CLIMATOLOGICAL SURVEY
Normal Annual Precipitation



OKLAHOMA CLIMATOLOGICAL SURVEY
Average Length of Growing Season
1981-2010
Calculated using data archived at OCS. Created 3:48:35 PM September 27, 2012 CDT. © Copyright 2012

Oklahoma's Surface Water Resources

- **34 major reservoirs store 13 million acre-feet of water**
- **4,300 public/private & watershed protection lakes**



Lake Eufaula:
Oklahoma's largest lake in surface area (105,000 acres)

Lake Texoma:
Oklahoma's largest lake in storage (2.6 million acre-feet)

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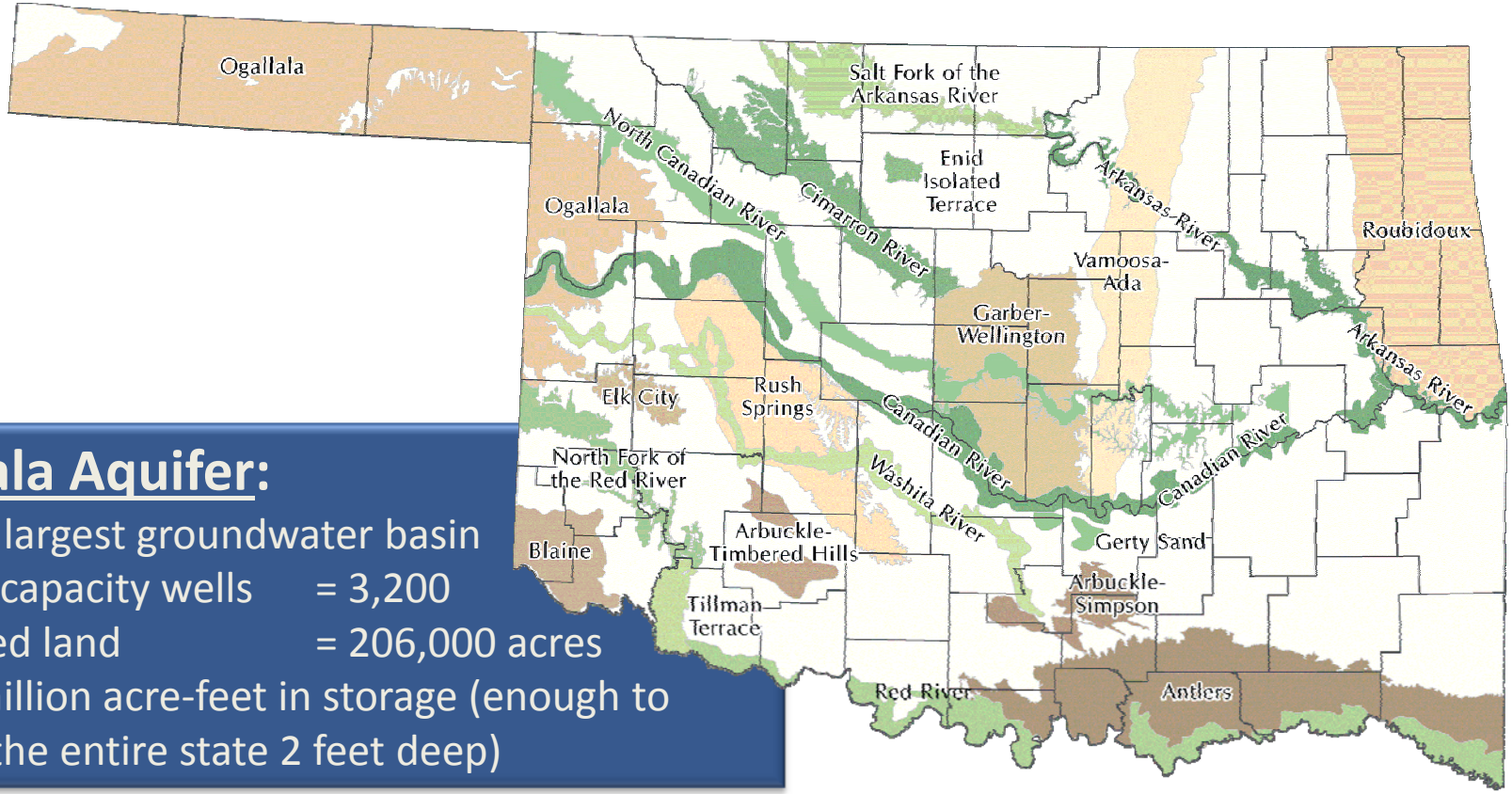
Oklahoma's Groundwater Resources

- **23 major groundwater aquifers store 320 million acre-feet of water**



Ogallala Aquifer:

- state's largest groundwater basin
- # high capacity wells = 3,200
- irrigated land = 206,000 acres
- 86.6 million acre-feet in storage (enough to cover the entire state 2 feet deep)

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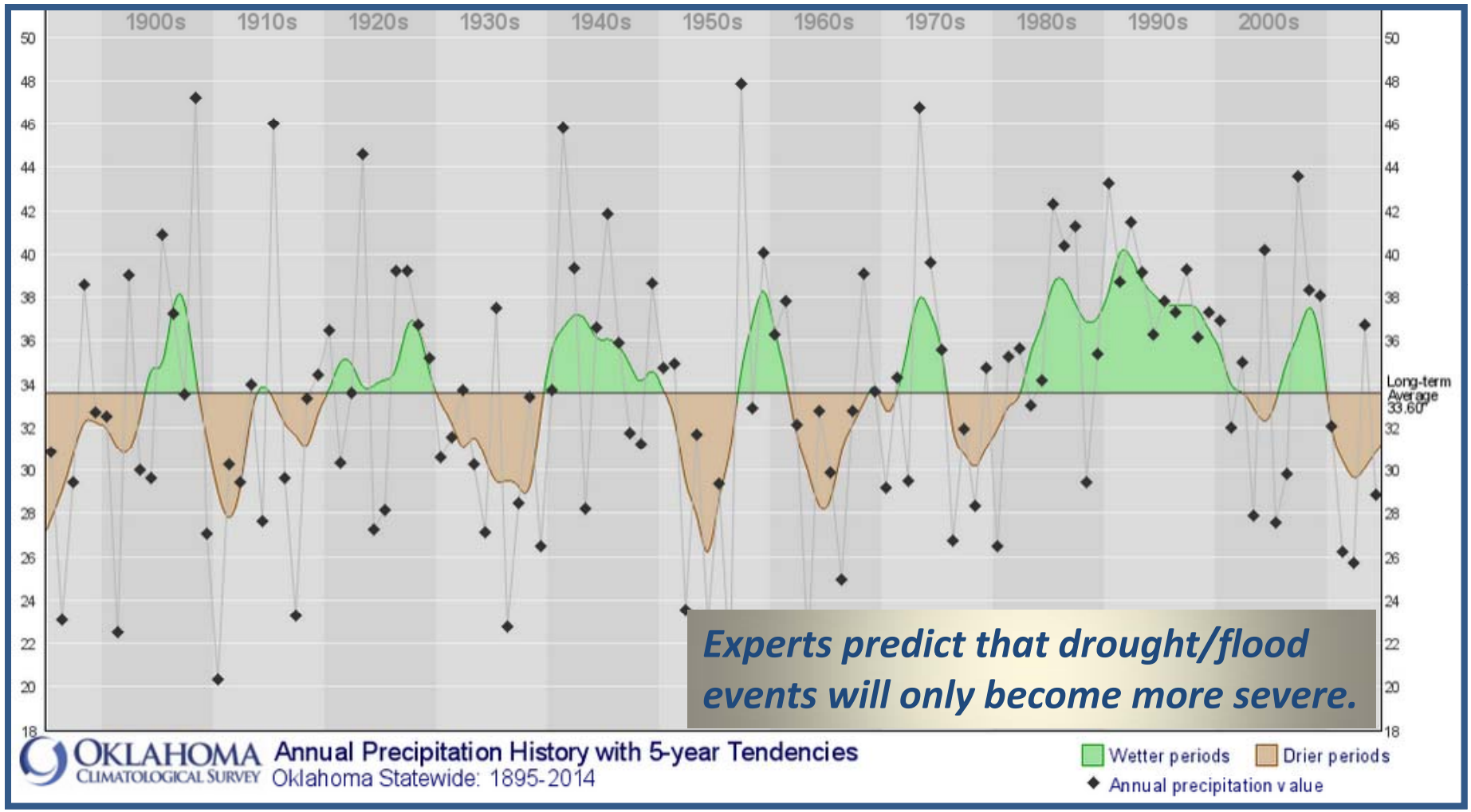
Oklahoma's Drought Cycles



Experts predict that drought/flood events will only become more severe.

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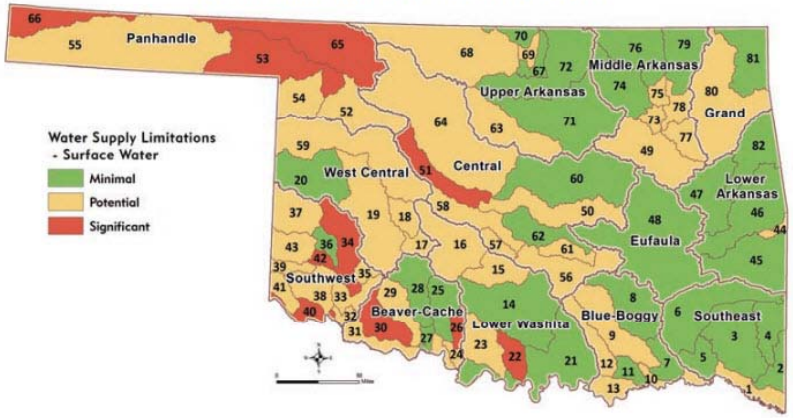
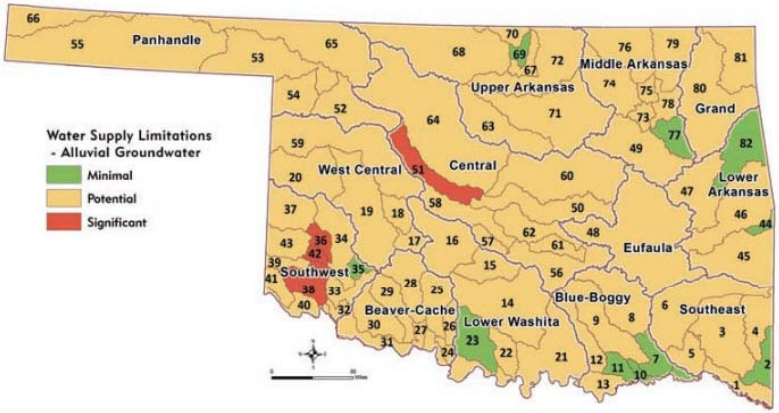
Future Water Supply Challenges

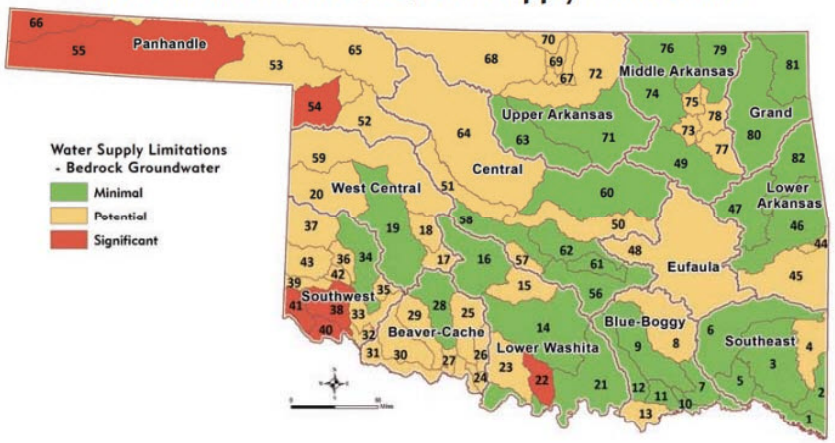
Basin Surface Water Limitations



Basin Alluvial Groundwater Supply Limitations



Basin Bedrock Groundwater Supply Limitations



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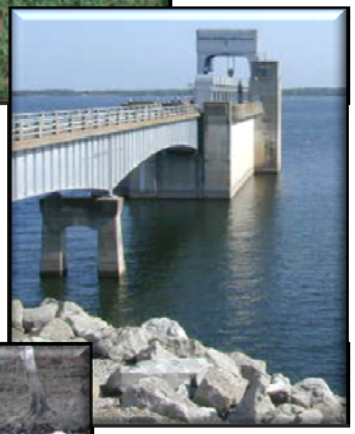
Future Water Supply Needs



- Population growth
- Economic development
- Infrastructure needs and costs
- Water quality
- Vulnerability to drought/flooding
- Managing water supply/demand
- Climate variability

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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

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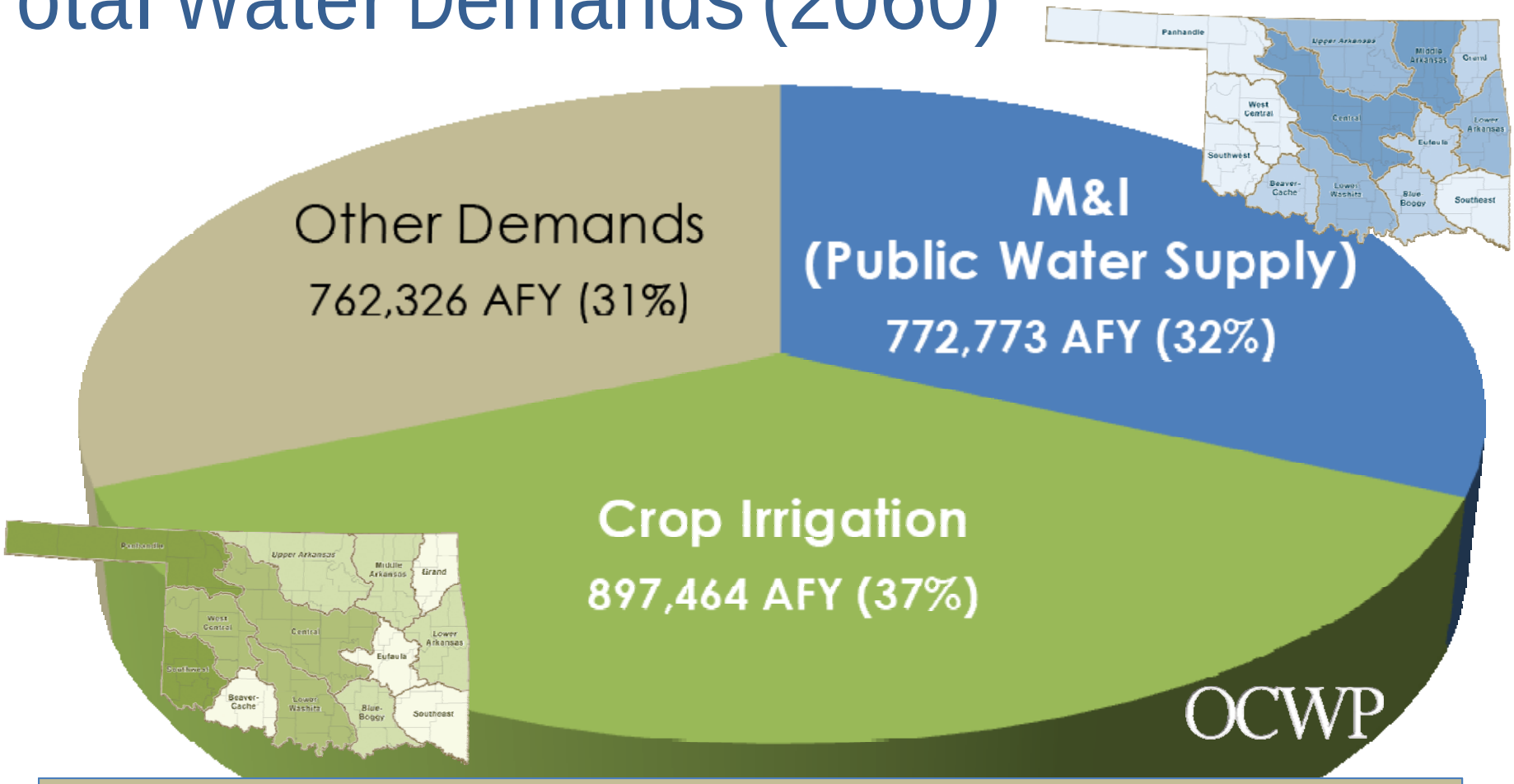
Total Water Demands (2060)



Other Demands:

Thermoelectric Power - 450,227 AF (18%) **Oil & Gas - 115,570 AF (5%)** **Livestock - 101,040 AF (4%)**

Self-Supplied Industrial - 54,334 AF (2%) **Self-Supplied Residential - 41,155 AF (2%)**

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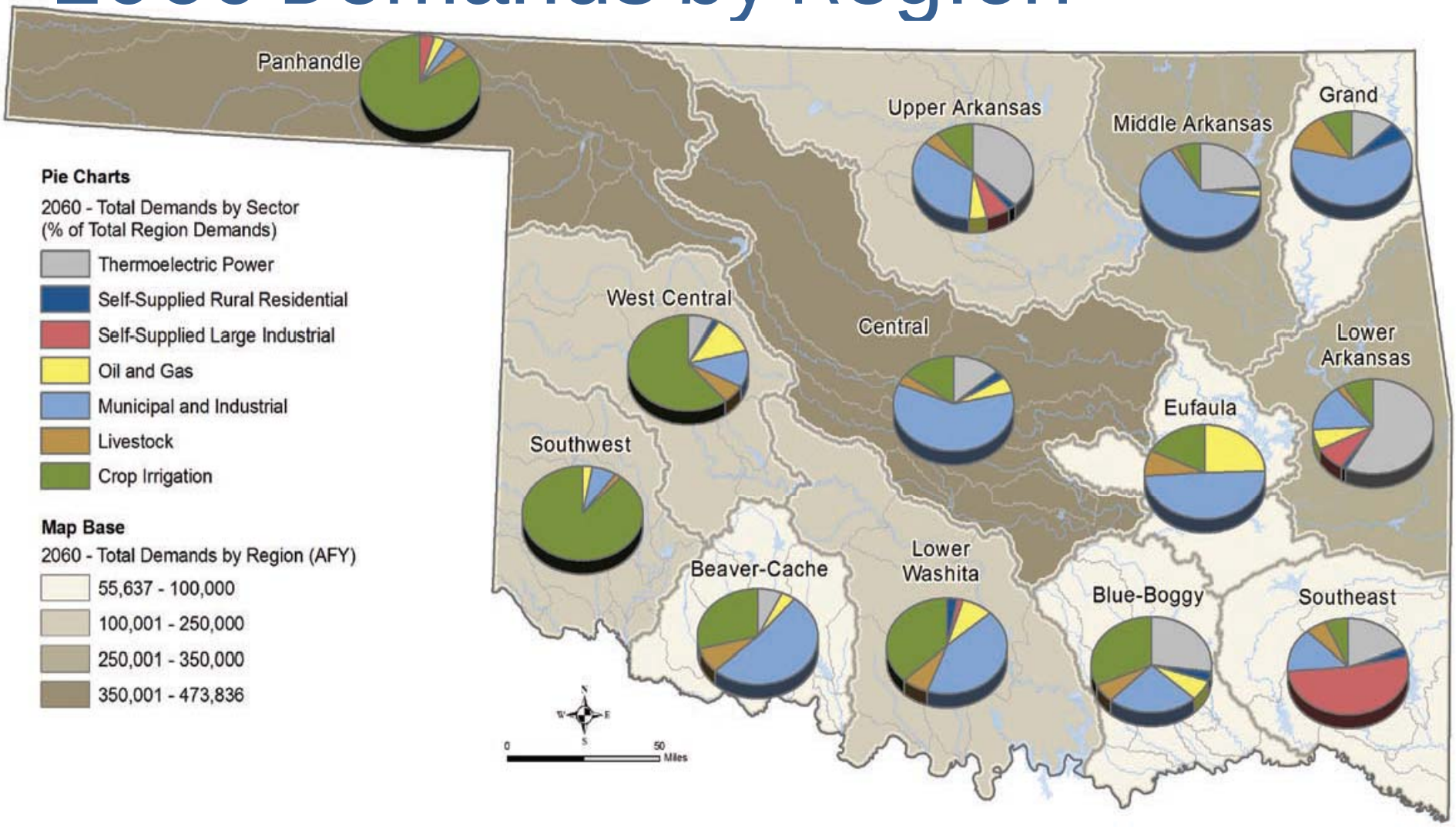
2060 Demands by Region



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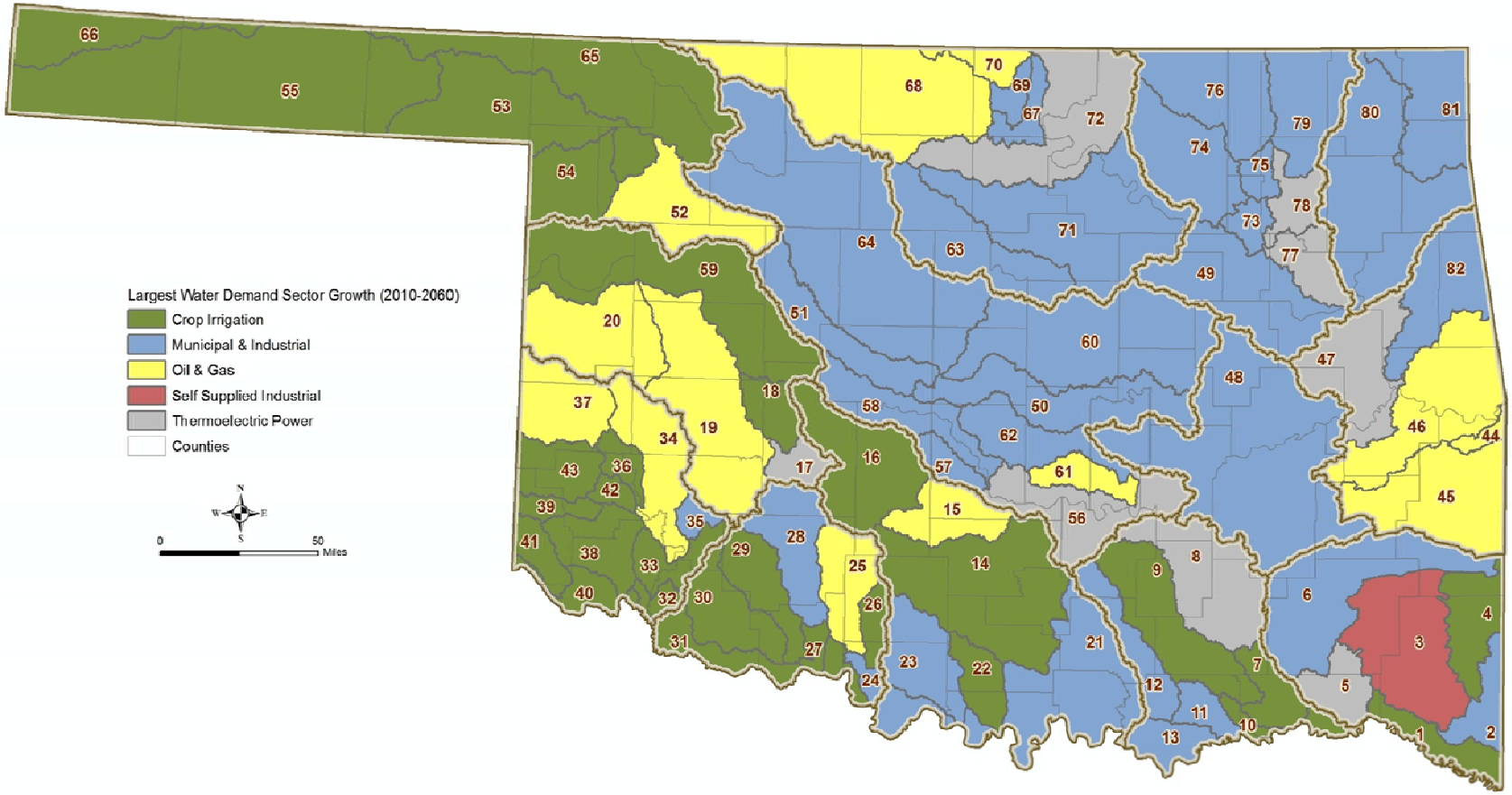
Largest Demand Sector Growth (2010-2060)



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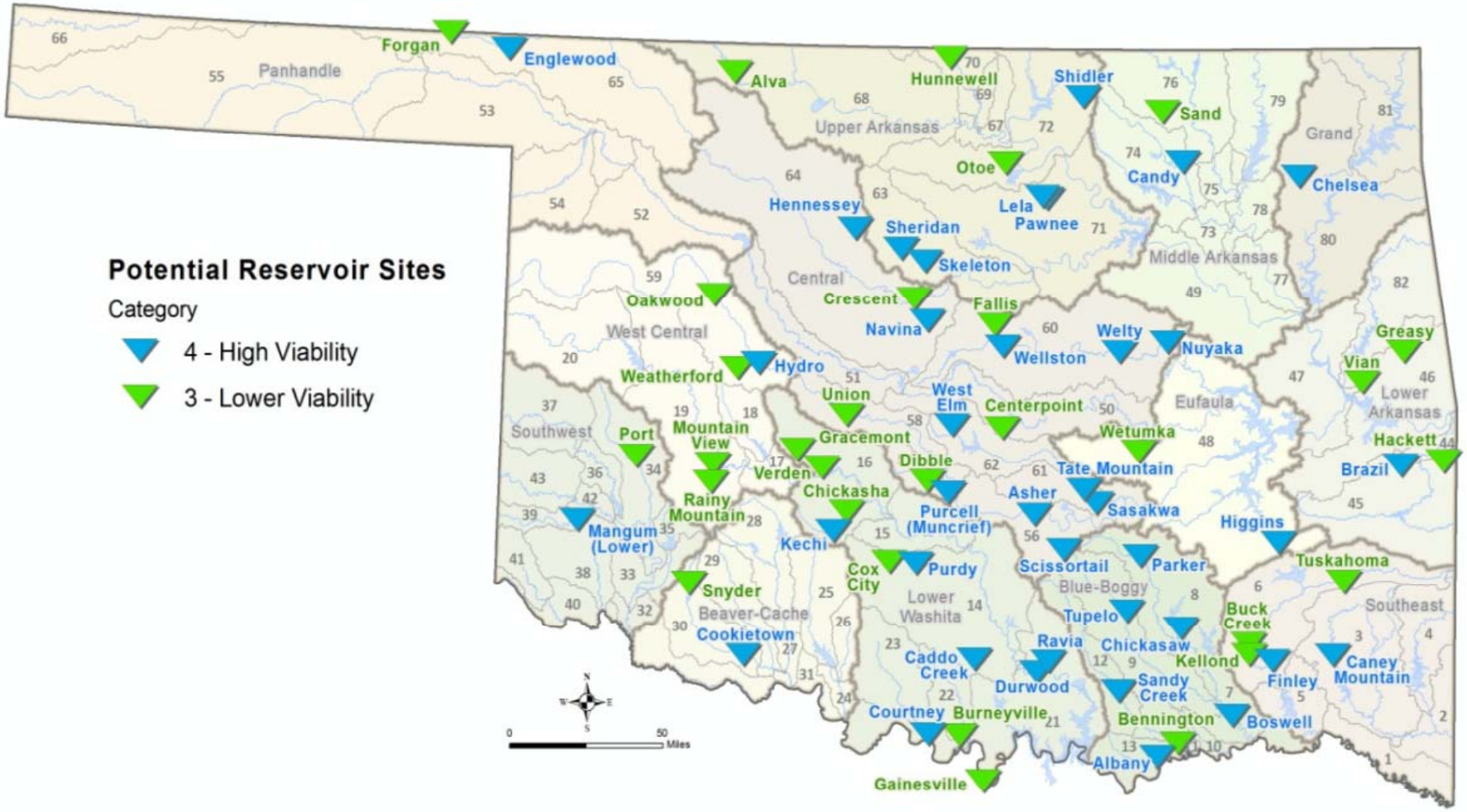
New Reservoirs?



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Estimated Cost of New Reservoirs

- 68 detailed studies of potential new reservoirs
- Construction Costs: $9 million to over $1 billion
- Dependable Yield Costs: $500 to $22,000 per AF

Five Lowest Estimated Proposals by Total Cost

Reservoir Name	County	Dependable Yield	Conservation Pool Storage	Updated Cost Estimate 2010	Cost per AF Yield
		AF	AF		
Centerpoint Lake	Pottawatomie	700	3000	$8,943,000	$12,775.71
Muncrief Dam	McClain	20000	112000	$28,757,000	$1,437.85
Wellston Lake	Lincoln	7700	25000	$54,023,000	$7,015.97
Verden Reservoir	Caddo	5000	34000	$56,222,000	$11,244.40
Shidler Lake	Osage	16803	54920	$58,264,000	$3,467.48

Five Lowest Estimated Proposals by Cost per A.F. Yield

Reservoir Name	County	Dependable Yield	Conservation Pool Storage	Updated Cost Estimate 2010	Cost per AF Yield
		AF	AF		
Caney Mountain	Pushmataha	280055	384720	$131,312,000	$468.88
Durwood Reservoir	Johnston	232000	306000	$166,429,000	$717.37
Asher Lake	Pontotoc	400000	550000	$373,610,000	$934.03
Bennington Res.	Bryan	179000	287420	$180,662,000	$1,009.28
Higgins Reservoir	Latimer	68000	190500	$84,651,000	$1,244.87

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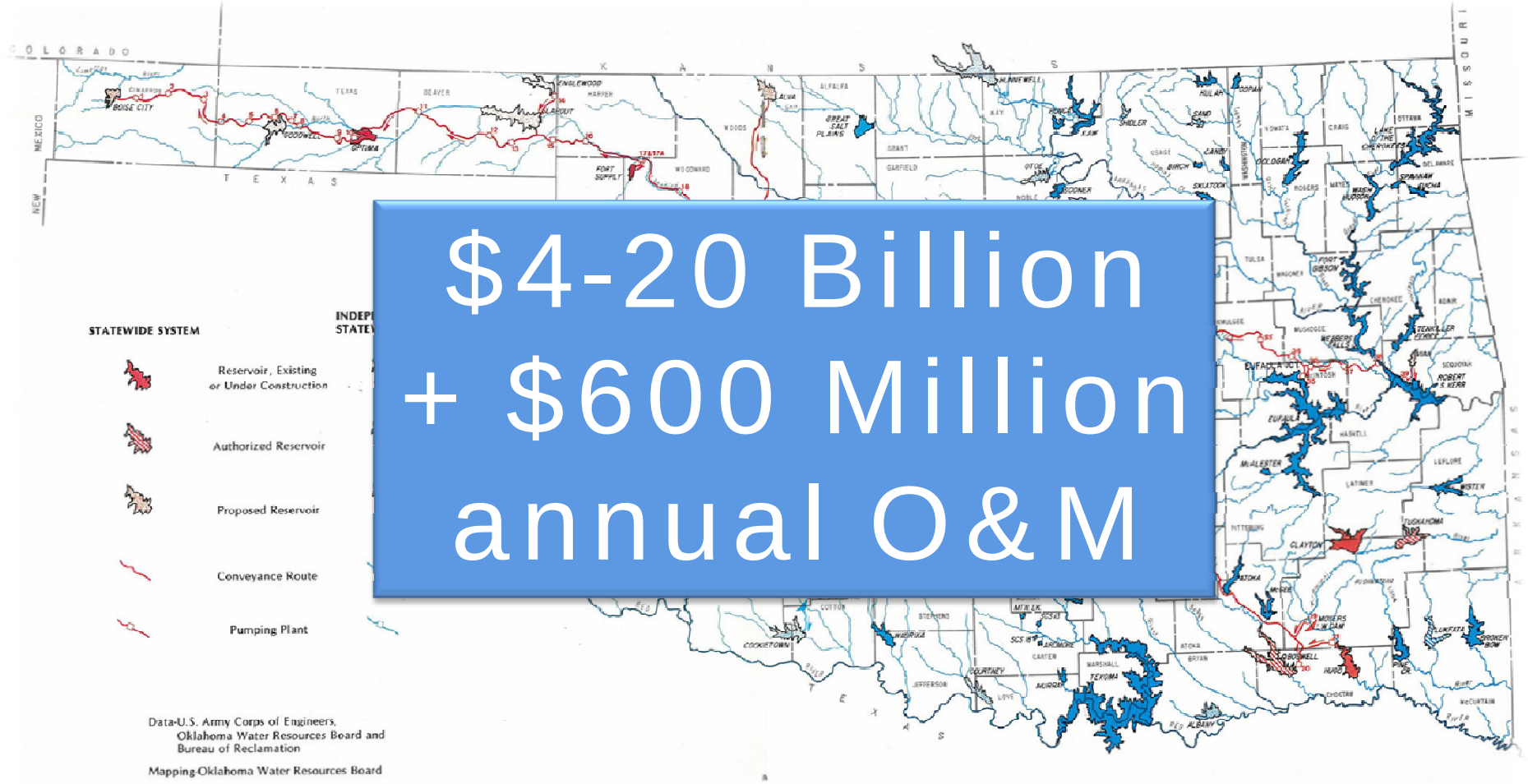
East-West Conveyance?



$4-20 Billion
+ $600 Million
annual O&M

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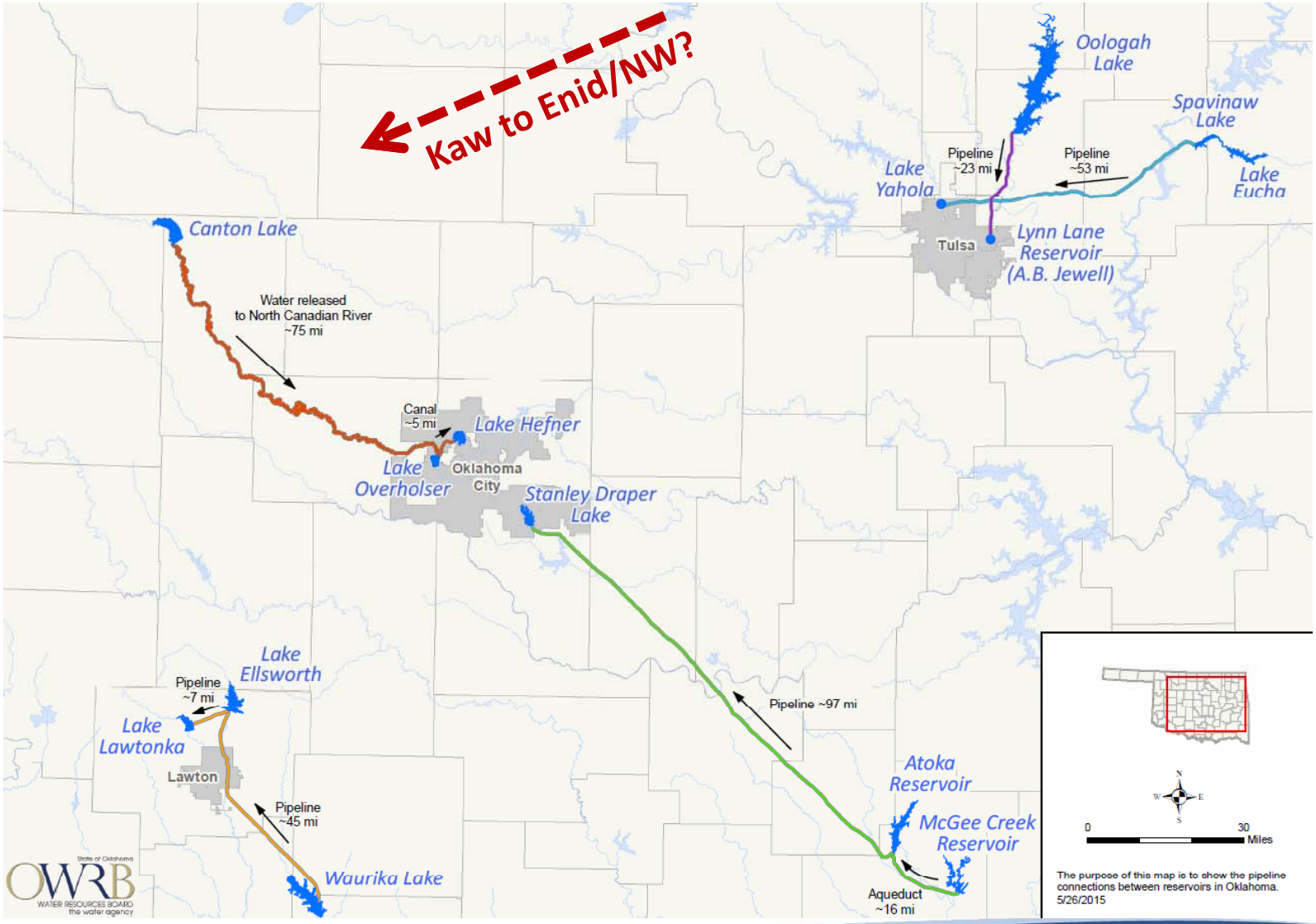
Smaller Out-of-Basin Transfers



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Oklahoma Comprehensive Water Plan

OCWP

BIG 8 PRIORITY RECOMMENDATIONS

- Infrastructure Financing
- Conservation, Reuse, Recycling
- Monitoring
- Supply Reliability
- Fish & Recreation Flows
- Excess/Surplus
- State/Tribal Resolution
- Regional Planning

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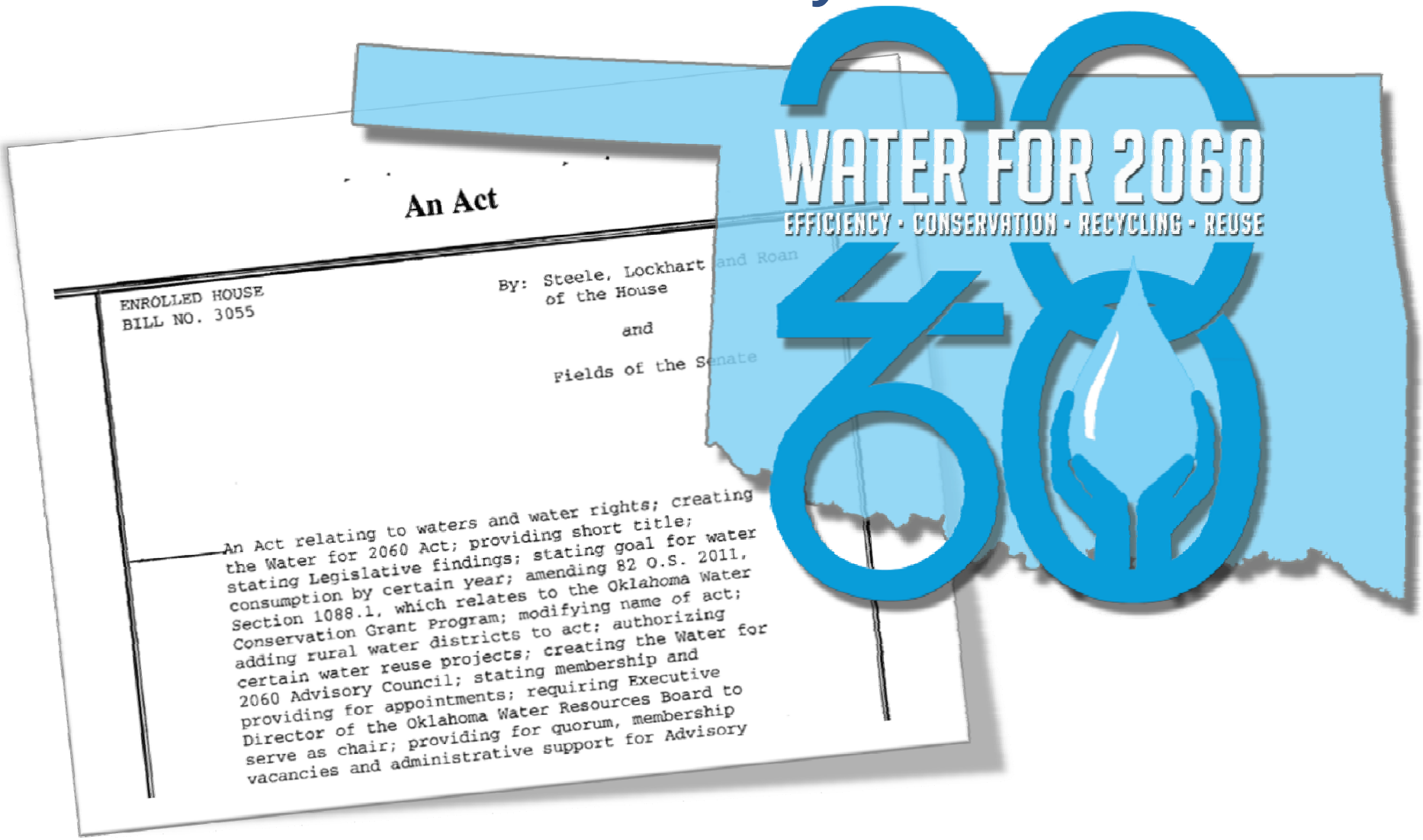
Conserve/Reuse/Recycle



An Act

ENROLLED HOUSE
BILL NO. 3055

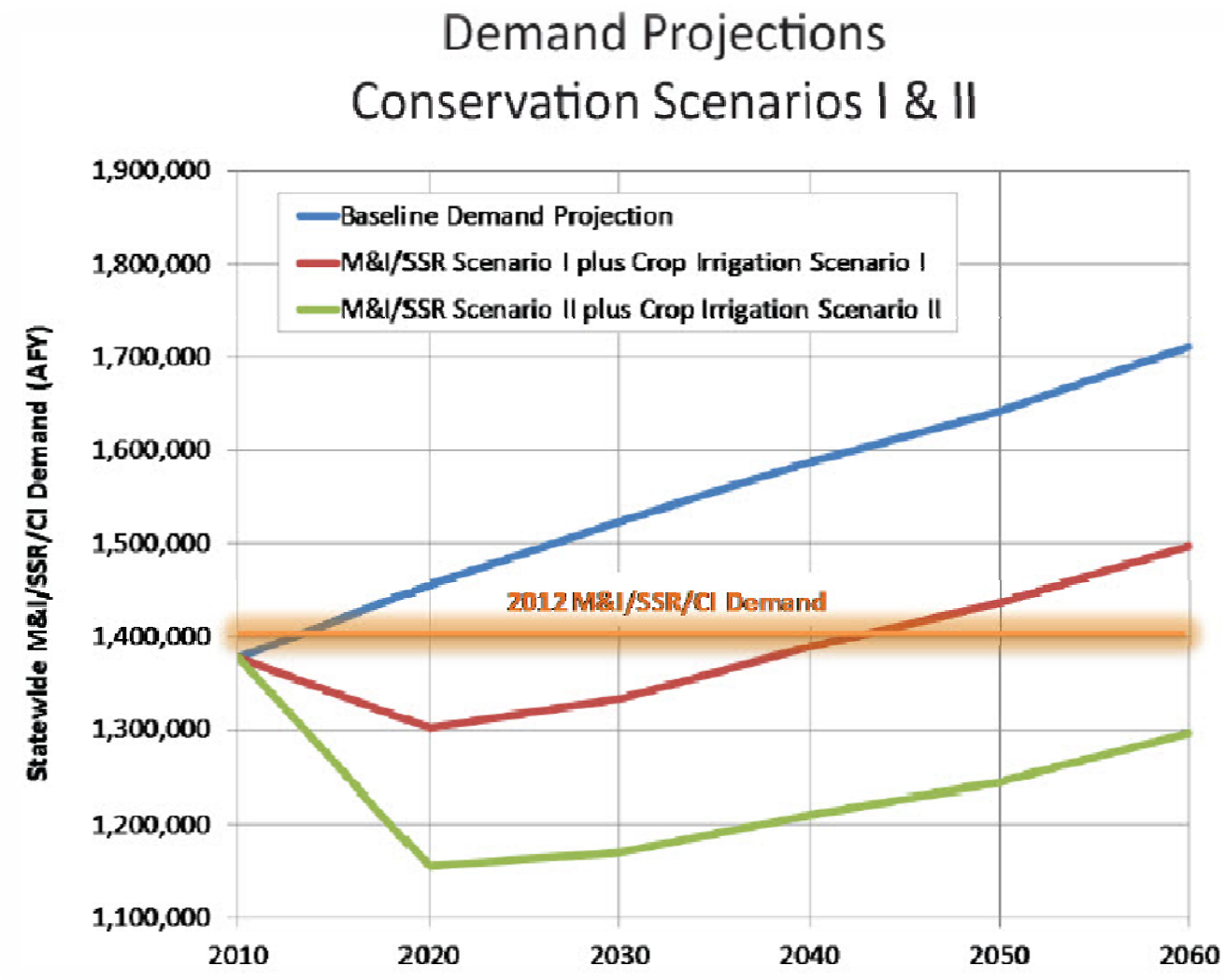
By: Steele, Lockhart and Roan of the House

and

Fields of the Senate

An Act relating to waters and water rights; creating the Water for 2060 Act; providing short title; stating Legislative findings; stating goal for water consumption by certain year; amending 82 O.S. 2011, Section 1088.1, which relates to the Oklahoma Water Conservation Grant Program; modifying name of act; adding rural water districts to act; authorizing certain water reuse projects; creating the Water for 2060 Advisory Council; stating membership and providing for appointments; requiring Executive Director of the Oklahoma Water Resources Board to serve as chair; providing for quorum, membership vacancies and administrative support for Advisory

Bold, Yet Attainable Goal



WATER FOR 2060
EFFICIENCY · CONSERVATION · RECYCLING · REUSE

Total fresh water use will need to be reduced by more than 30% by 2060 to maintain 2012 levels of use.

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Water for 2060 Advisory Council

Members:

- J.D. Strong, Chairman
- Jim Bachmann (Tulsa)
- Lauren Brookey (Tulsa)
- Tom Buchanan (Altus)
- Bob Drake (Davis)
- Danny Galloway (Stillwater)
- Roger Griffin (Broken Bow)
- Charlette Hearne (Broken Bow)
- Mark Helm (OKC)
- Nathan Kuhnert (OKC)
- Phil Richardson (Minco)
- Kevin Smith (Enid)
- Trent Smith (Choctaw)
- Joe Taron (Shawnee)
- Jerry Wiebe (Hooker)

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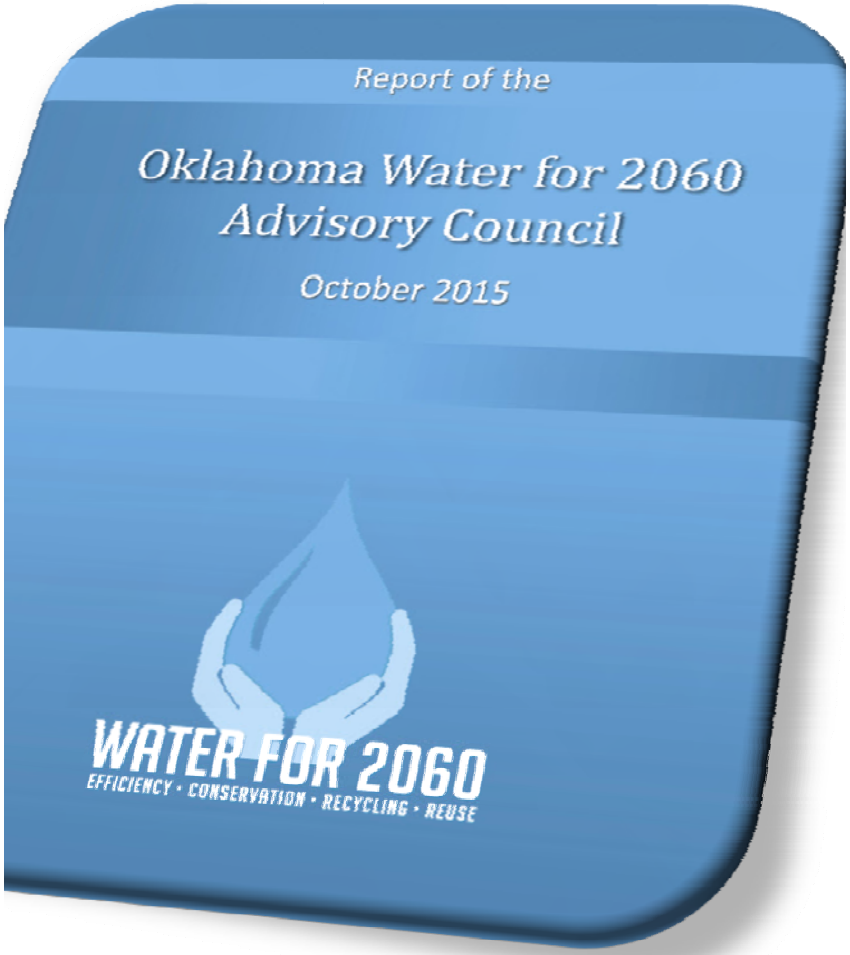
Final Report Submitted

Water for 2060 Advisory Council Recommendations

All Water Use Sectors (A)	A-1	Develop public education and outreach materials, a statewide resources conservation campaign, and an Oklahoma water efficiency portal.
Public Water Supply (PWS)	PWS-1	Develop an Oklahoma public water supply system water efficiency best practices guide.
	PWS-2	Develop a state recognition and rewards program for highly efficient public water supply systems.
	PWS-3	Develop an Oklahoma water system loss reduction best practices guide.
	PWS-4	Provide state funding and financing for water system loss reduction.
	PWS-5	Encourage regionalization and supply sharing.
Crop Irrigation (CI)	CI-1	Apply state financing programs to water-efficient crop irrigation equipment conversion and practices.
	CI-2	Develop an Oklahoma crop irrigation best practices guide.
	CI-3	Actively support federal crop insurance reform.
Energy & Industry (EI)	EI-1	Facilitate increased sharing of information and supplies between energy and industry water users.
	EI-2	Develop an energy and industry water use best practices guidance and recognition program.
	EI-2	Promote industrial use of marginal quality waters.



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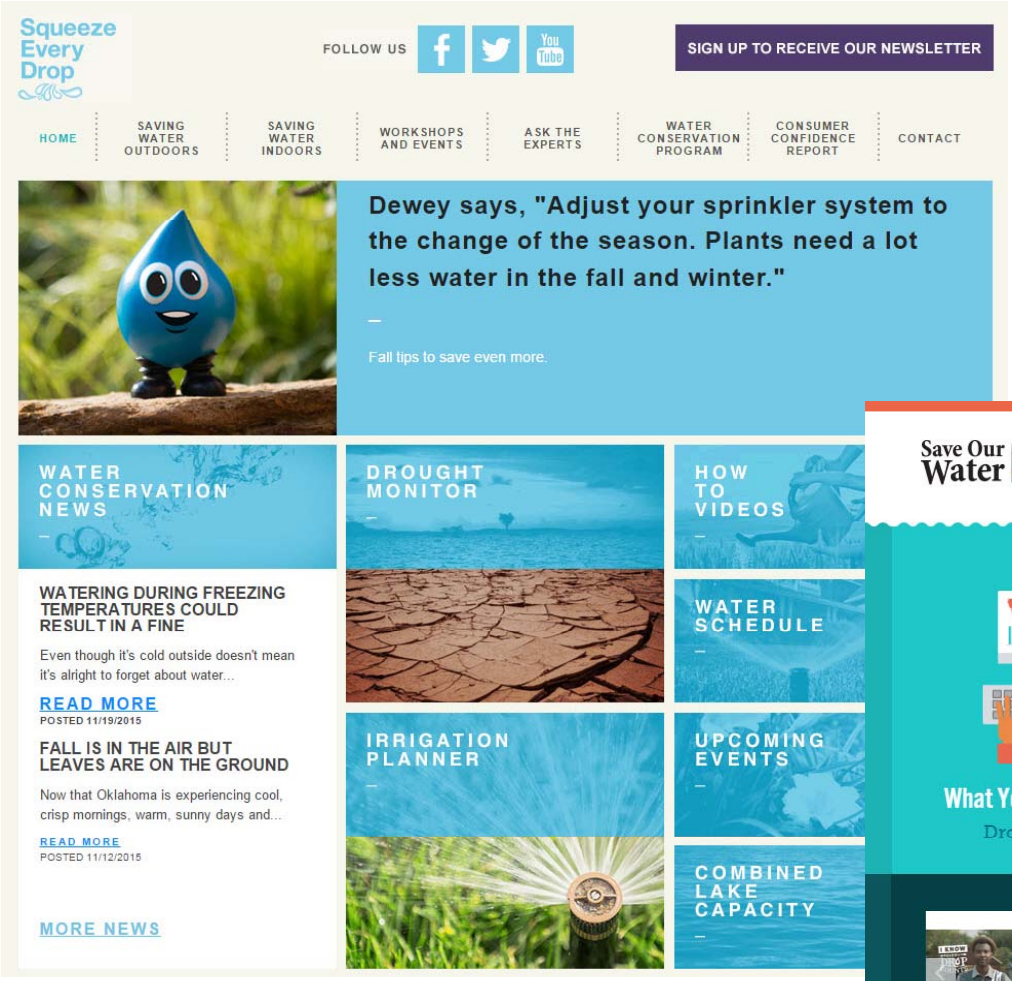
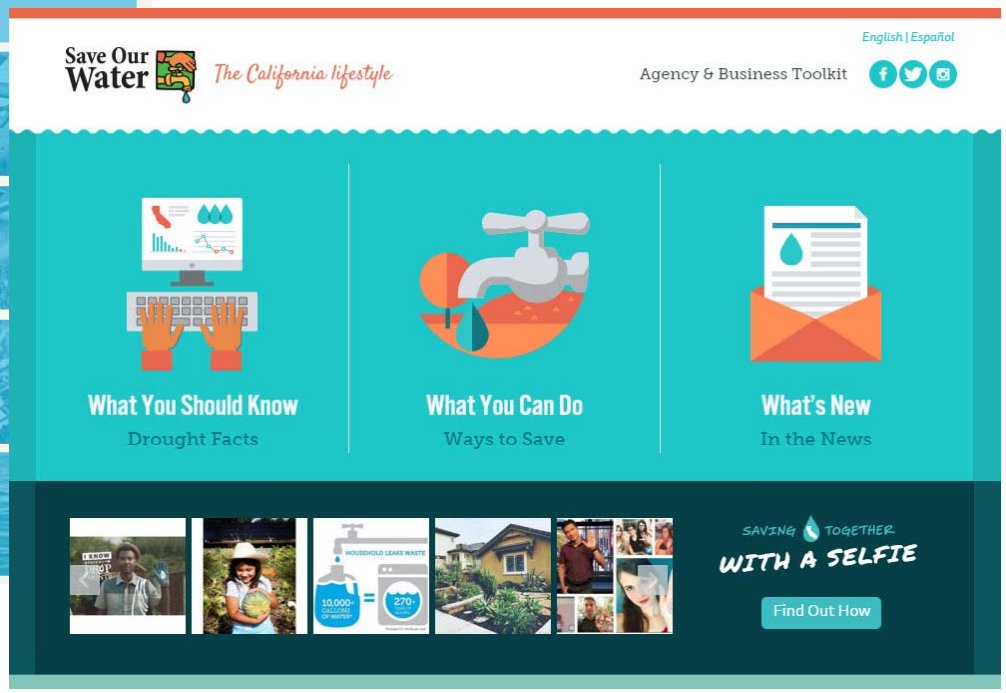
Education & Outreach Campaigns





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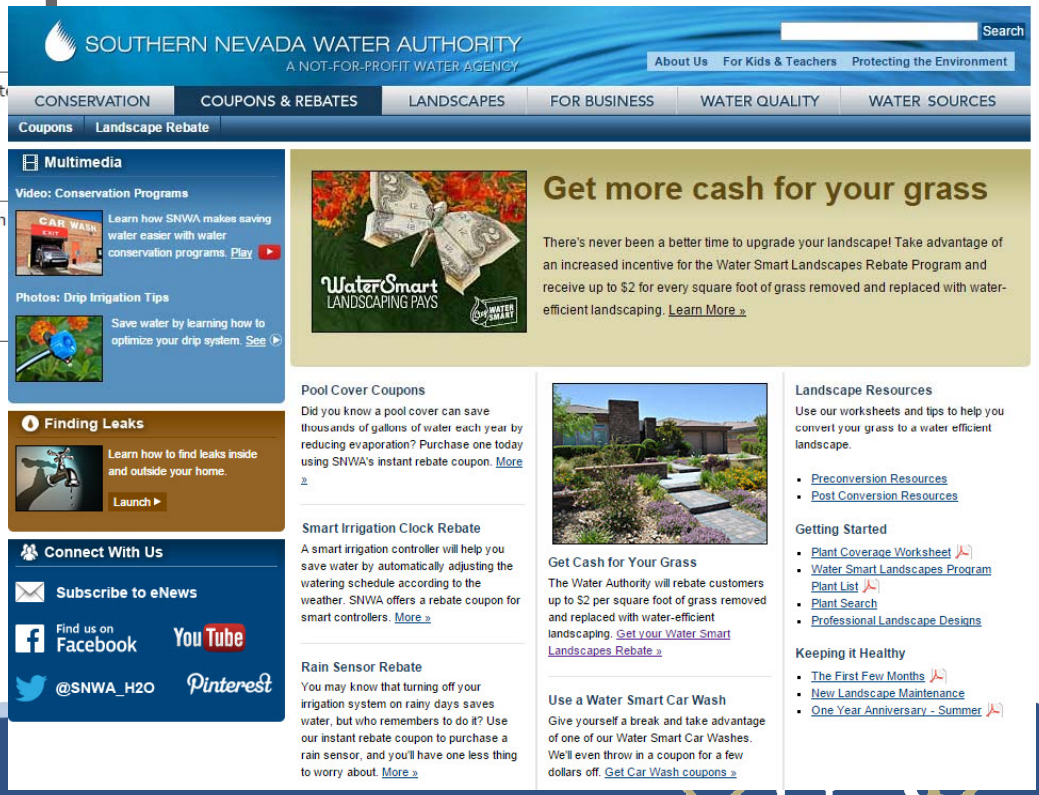
Recognition/Incentive Programs

Mark	What It Means
Label	Identifies a water-efficient product that has been independently tested and certified to meet EPA WaterSense criteria for efficiency and performance.
Promotional Label	Advertises the availability of WaterSense labeled products and encourages consumers to look for them. Shows consumers what the WaterSense label looks like.
Partner Logo	Signifies an organization's commitment to promoting water efficiency, demonstrat by a signed partnership agreement between that organization and EPA.
Promotional Logo	Promotes the WaterSense program in materials when talking about WaterSense in general or educating the public about the program.

EPA WaterSense 2015 PARTNER OF THE YEAR

WATER FOR 2060
EFFICIENCY · CONSERVATION · RECYCLING · REUSE



Marginal Quality Water

Basins with Greatest Potential to Offset Fresh Water Use with MQ Water

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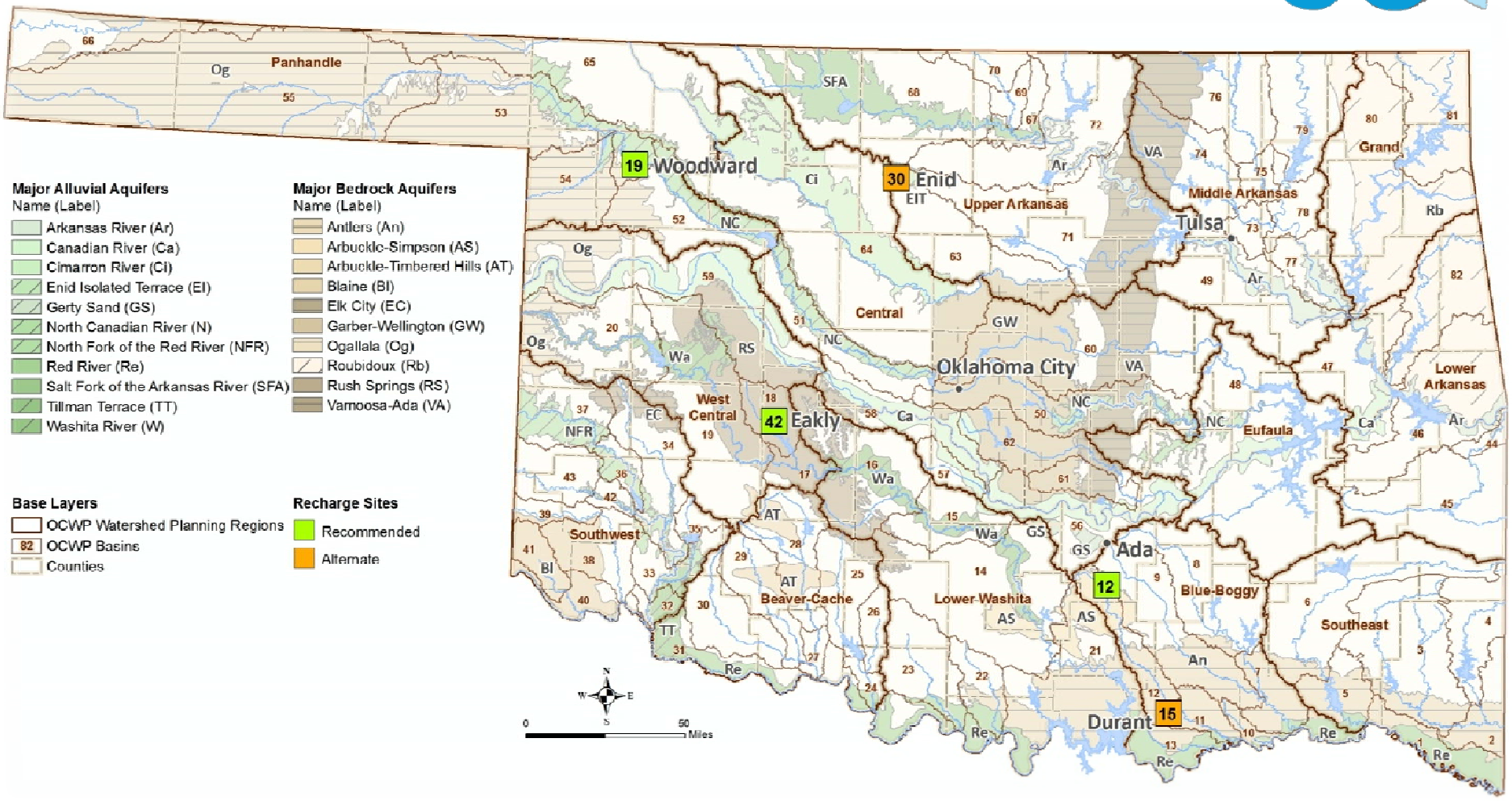
Aquifer Storage & Recovery



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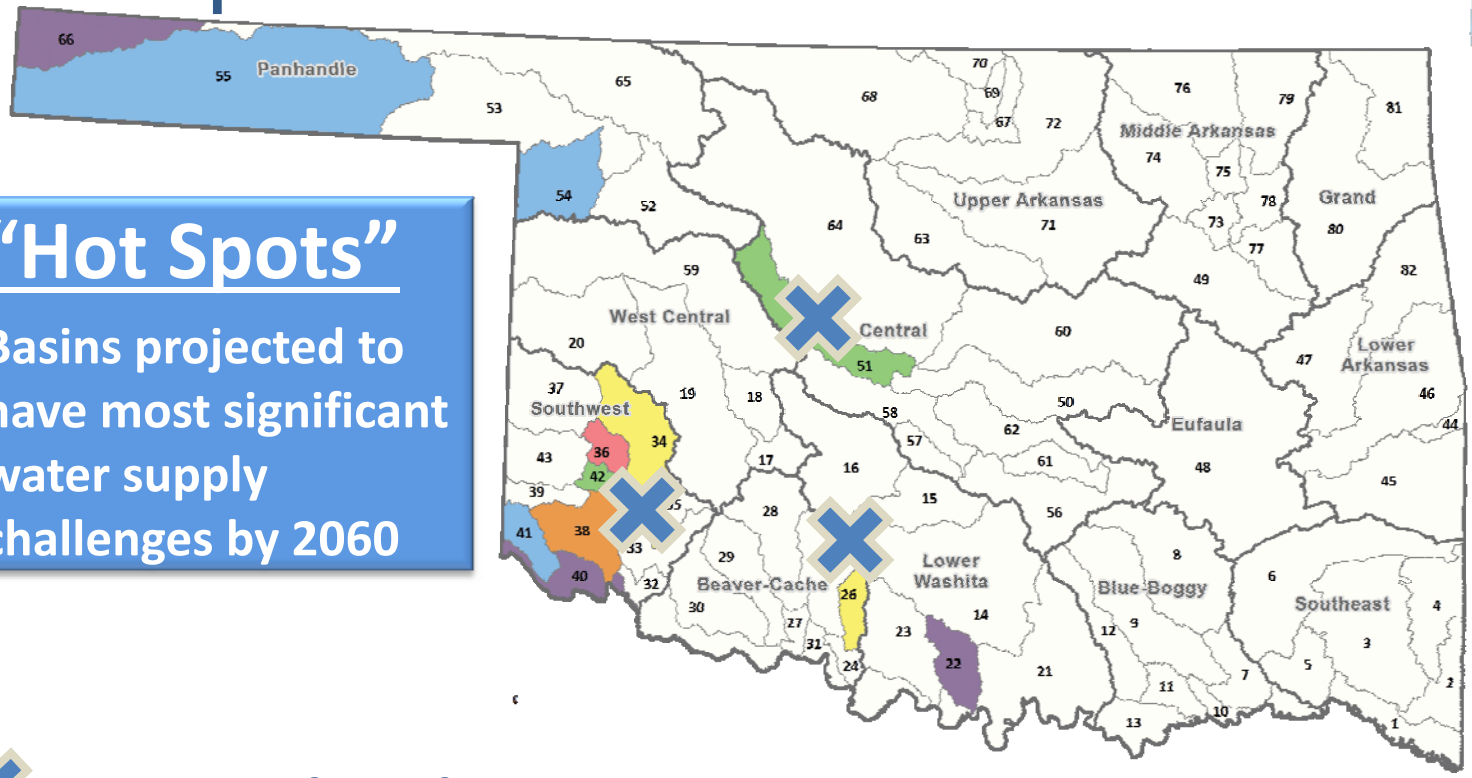
“Hot Spot” Demo Studies



“Hot Spots”

Basins projected to have most significant water supply challenges by 2060

- **Marginal quality water use – Basin 51 near Watonga & Yukon**
- **Regionalization of public supply systems – Basin 38 near Altus**
- **Water conservation – Basin 26 near Duncan & Comanche**

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The Cheapest Source of Water…

"Oklahoma is truly unique in setting such an ambitious goal for water efficiency, conservation, recycling and reuse…. there is no doubt that **it will take each and every one of us working together** to become the nation's most water-efficient state."

- Governor Mary Fallin

Plan.

Do!

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Regional Planning

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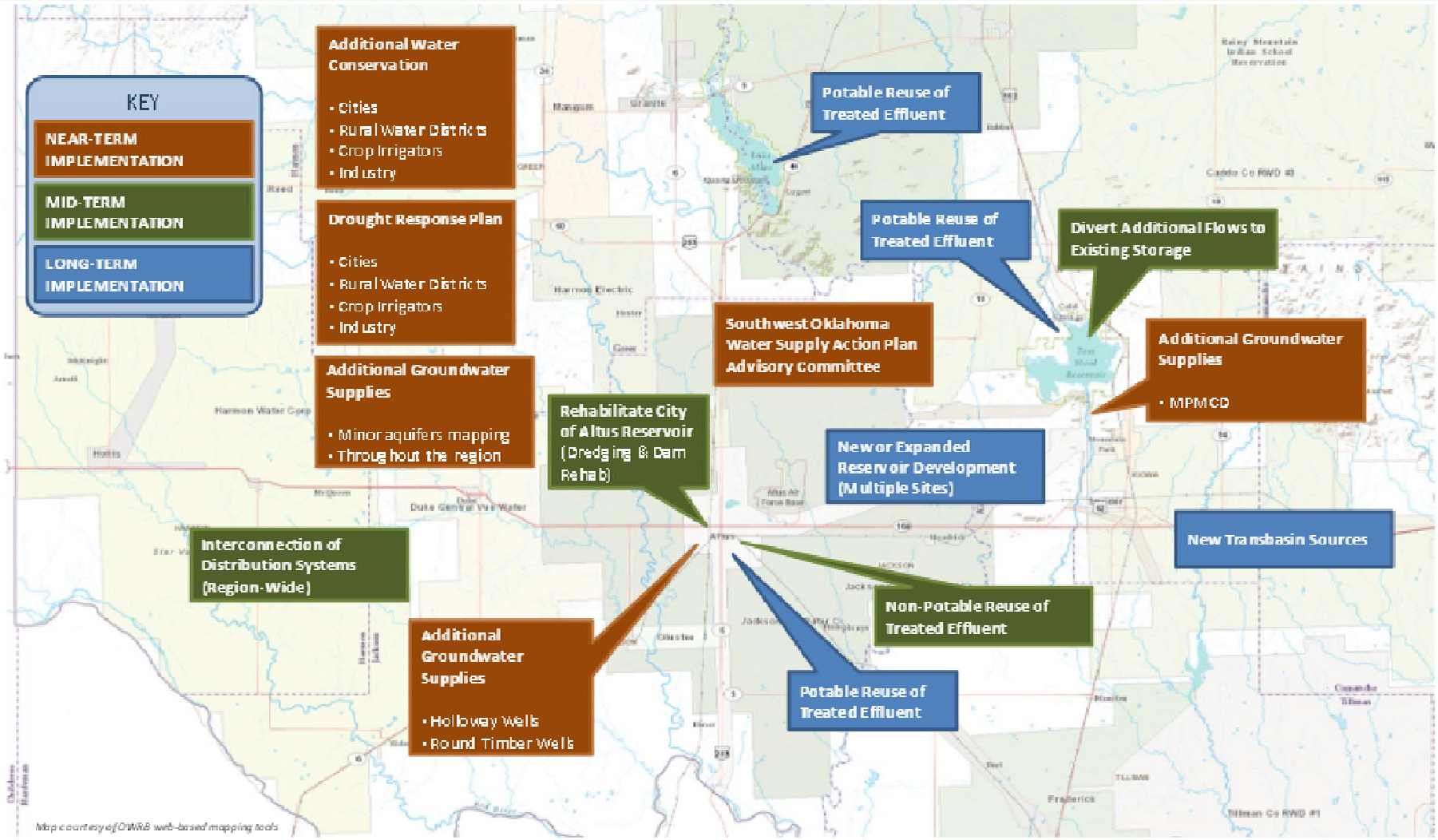

PHASED IMPLEMENTATION PLAN

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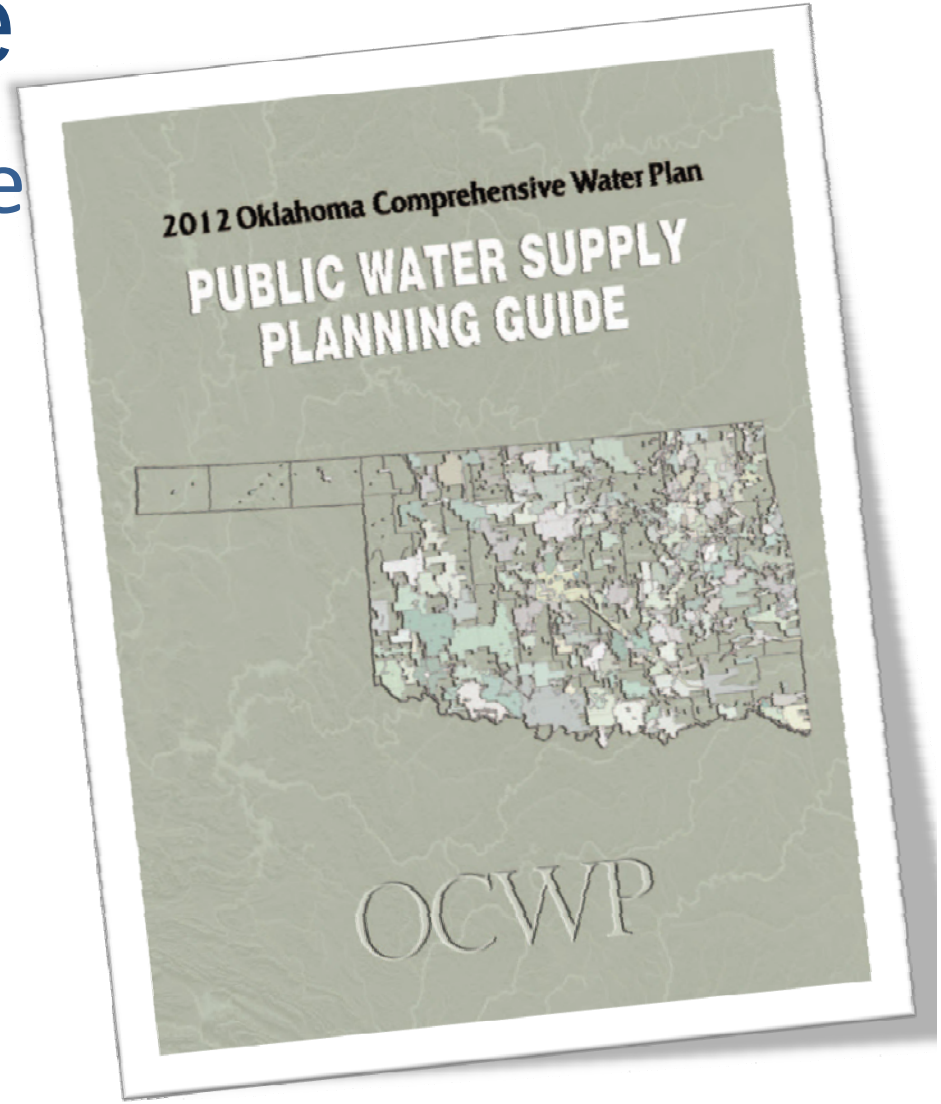
Planning Assistance

- Shifted OCWP Update resources (GPT $) to regional planning
- Guides, models and tools to support efforts
- OWRB Planning Coordinator focused on regional planning



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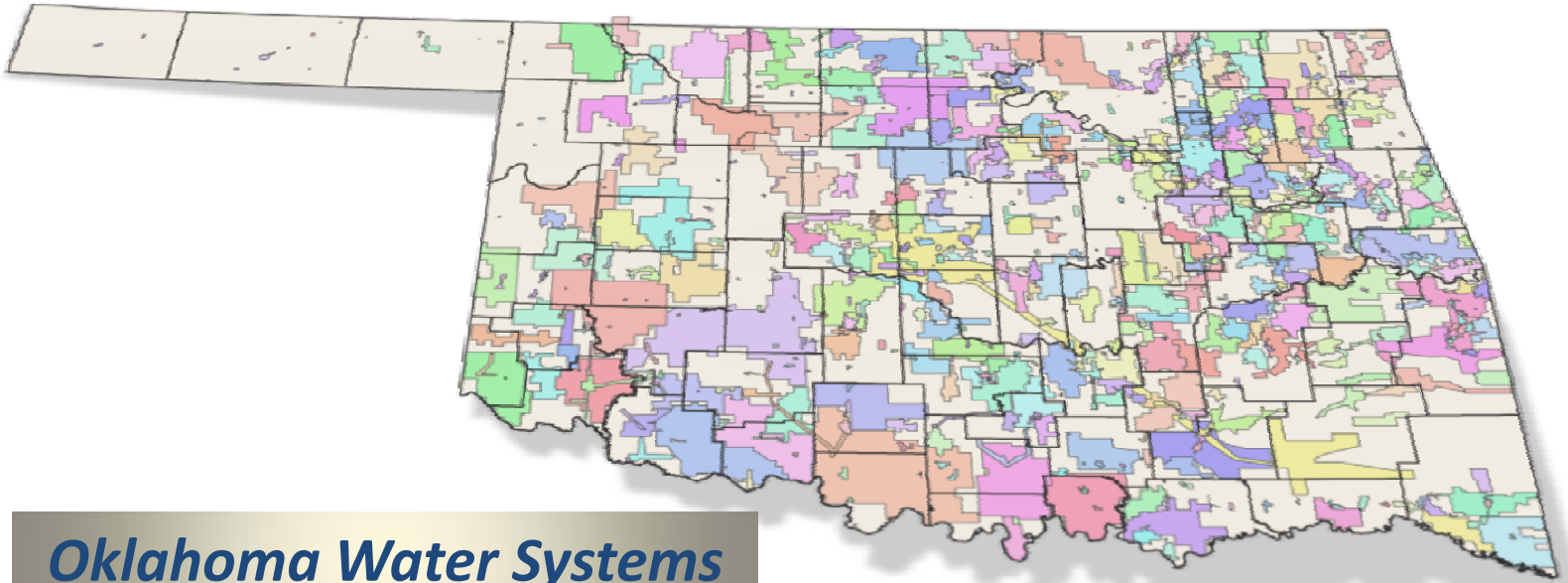
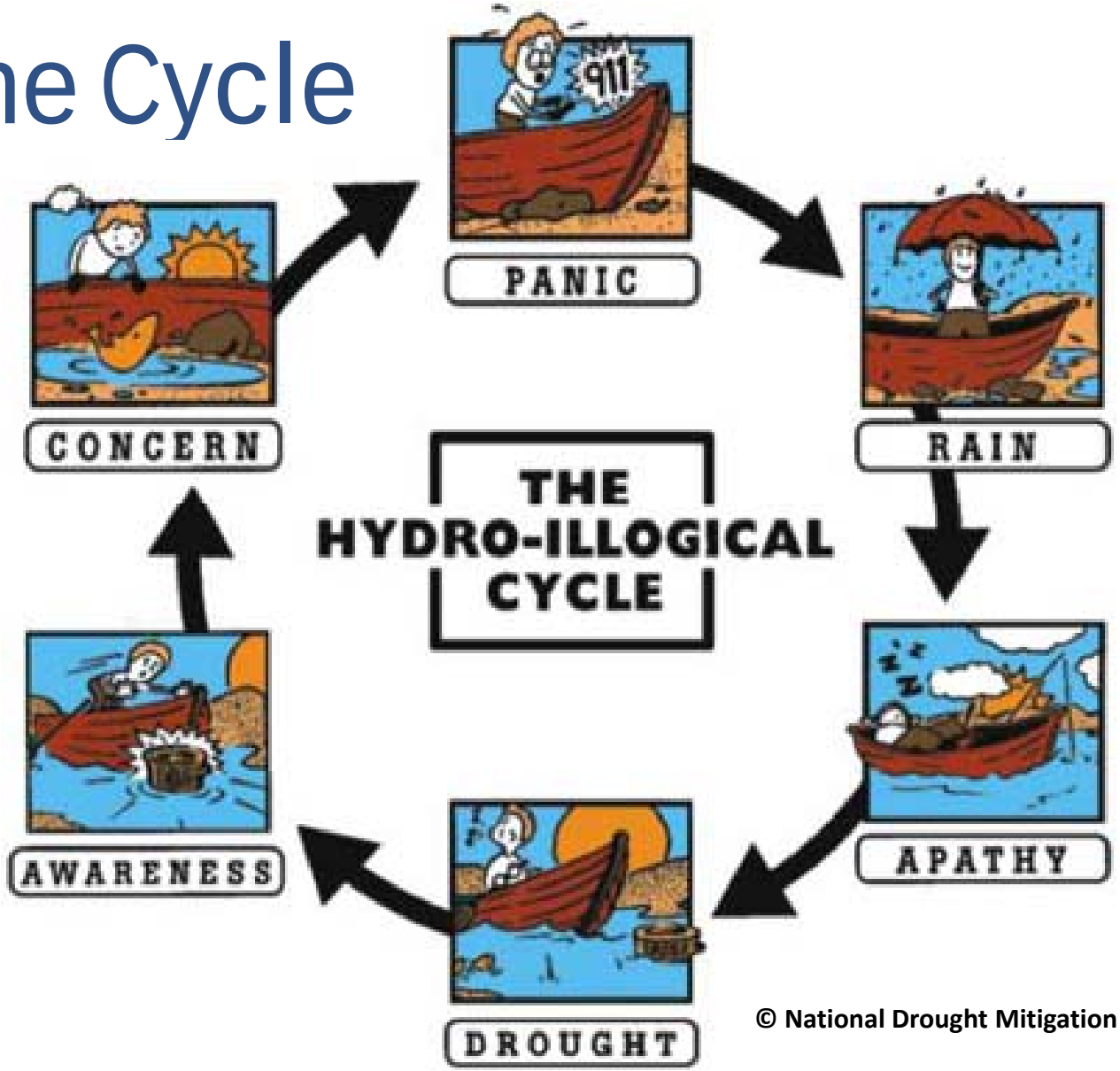
Regionalization/Consolidation

- 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

Break the Cycle



© National Drought Mitigation Center

Double-Down on Drought

- **Plan… locally, ahead, for the worst**
- **Conserve, reuse, recycle… innovate!**
- **Invest in the repair and construction of smart, efficient projects**
- **Monitor & measure**
- **(Rinse.) Repeat.**

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36th Annual Oklahoma Governor's Water Conference and Research Symposium

Tuesday & Wednesday, December 1st & 2nd
at the Embassy Suites in Norman, Oklahoma

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WATER RESOURCES BOARD
the water agency

www.owrb.ok.gov

Thank You!

J.D. Strong

Executive Director

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