



Water for 2060

EFFICIENCY – CONSERVATION – RECYCLING – REUSE

Hot Spot Basin Public Meeting

Goodwell, Oklahoma
March 11, 2014

Quartz Mountain, Oklahoma
March 12, 2014

Duncan, Oklahoma
March 13, 2014

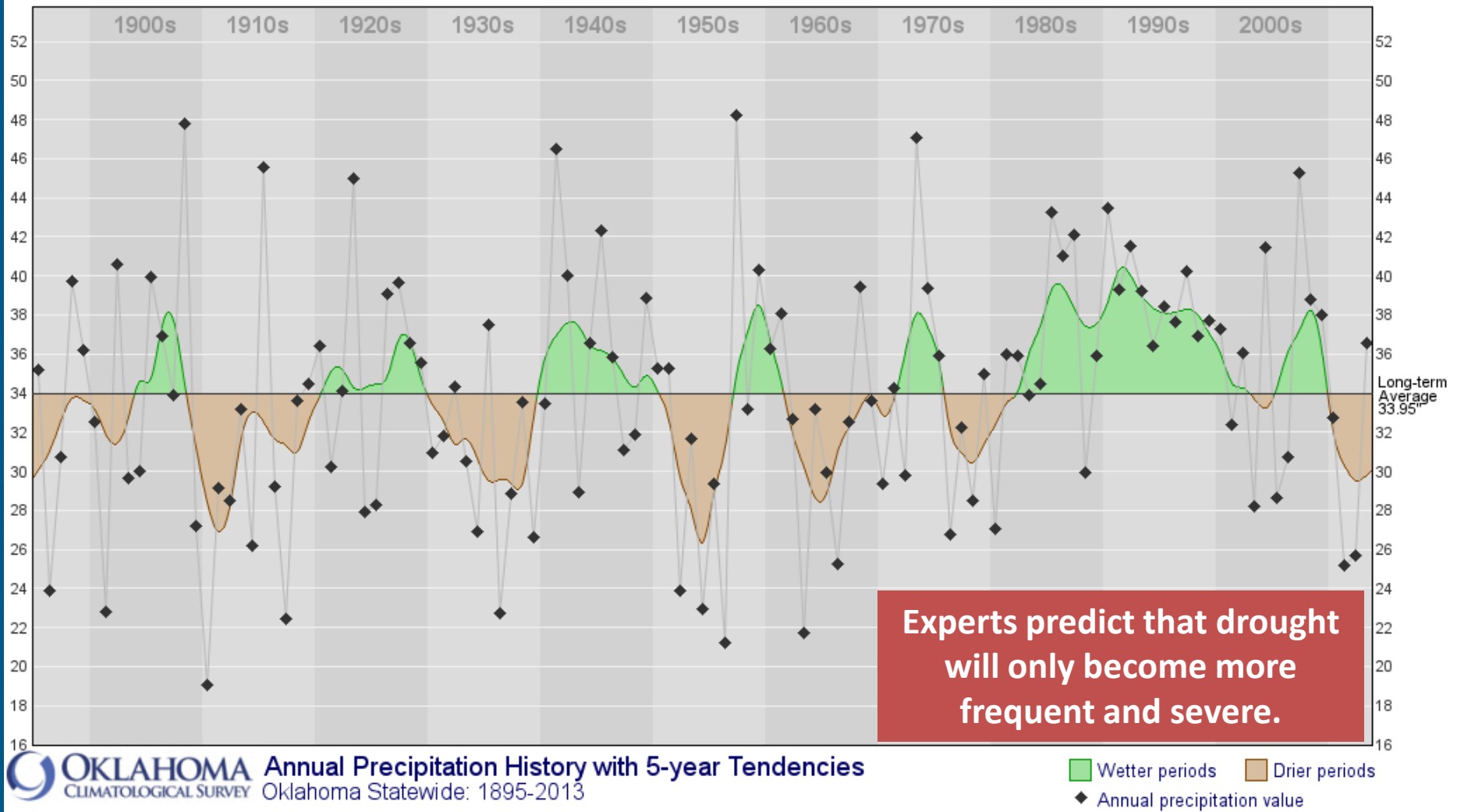
Yukon, Oklahoma
April 16, 2014

State of Oklahoma
OWRB
WATER RESOURCES BOARD
the water agency

Agenda

- Welcome
- Presentation
 - Hot Spot Basins
 - Overview of Hot Spot Basins in this Area
 - Current and upcoming Water for 2060 activities
 - How can water providers, agricultural producers, and water users monitor and participate?
- Discussion and Input

Oklahoma's Precipitation History (1895-2013)



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Key Findings from the Oklahoma Comprehensive Water Plan

OCWCP
Oklahoma Comprehensive Water Plan

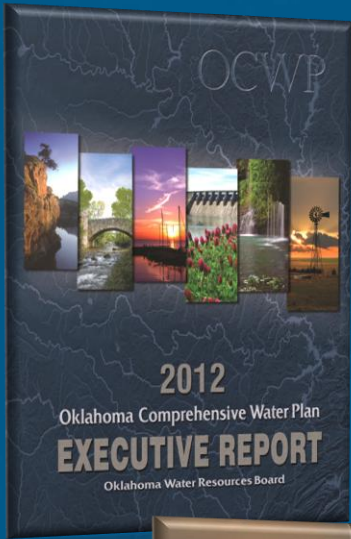


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Goals of the 2012 Update of the Oklahoma Comprehensive Water Plan

1. Characterize **demands** by water use sector.
2. Identify **reliable supplies** to meet forecasted demands.
3. Perform **technical studies** to evaluate emerging water management issues.
4. Comprehensive **stakeholder engagement** to develop appropriate water policy recommendations.
5. Ensure water resources management programs that **create reliability**.
6. Make “**implementable**” **recommendations** based upon technical evaluations and stakeholder input.

Most Comprehensive Plan Ever

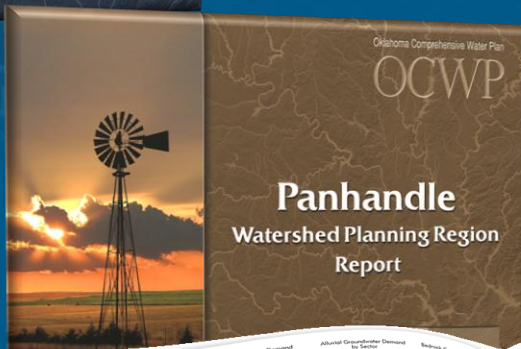


Executive Report:

- Synthesis of OCWP technical studies and results
- Water policy recommendations

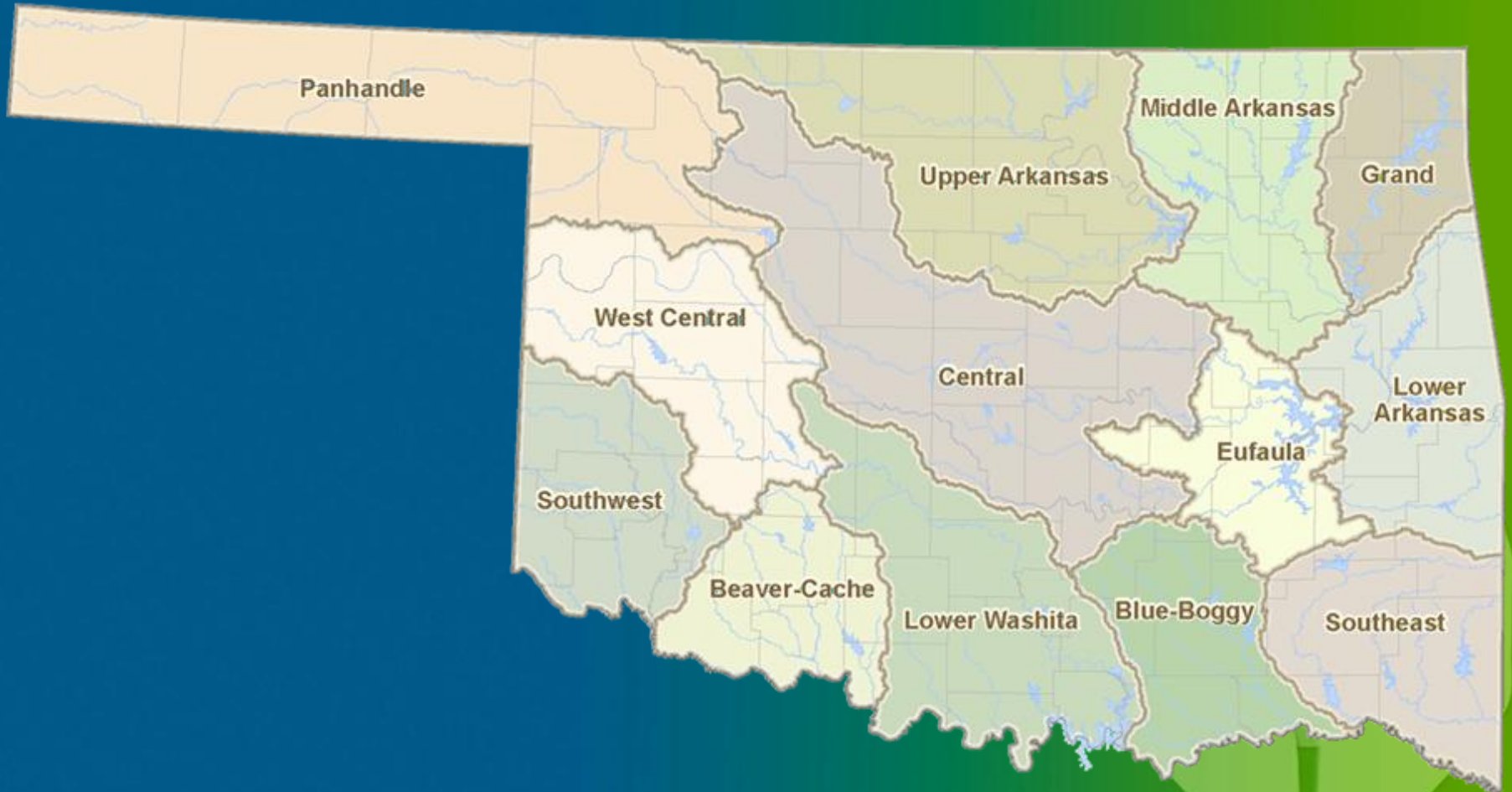
13 Watershed Planning Region Reports:

- Results of OCWP technical analyses, including options to address identified local water shortages

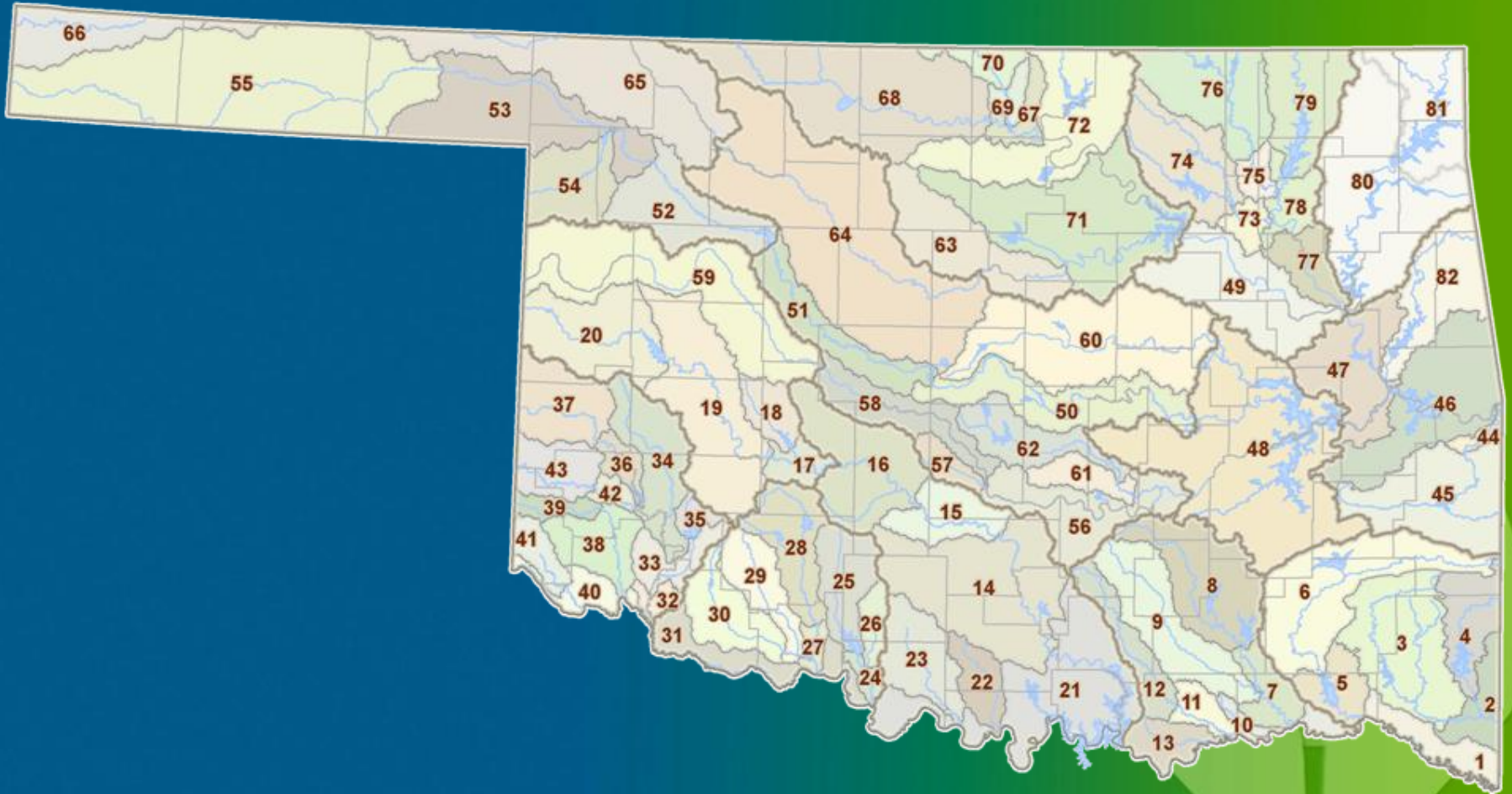


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13 Watershed Planning Regions



82 Basins for Detailed Analysis



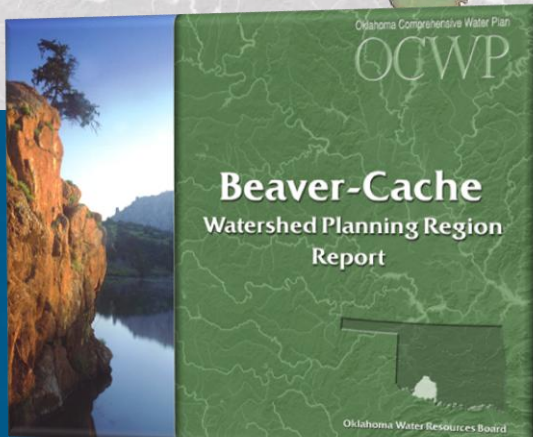
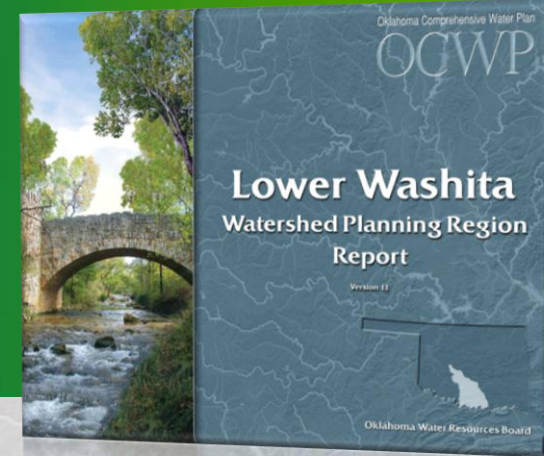
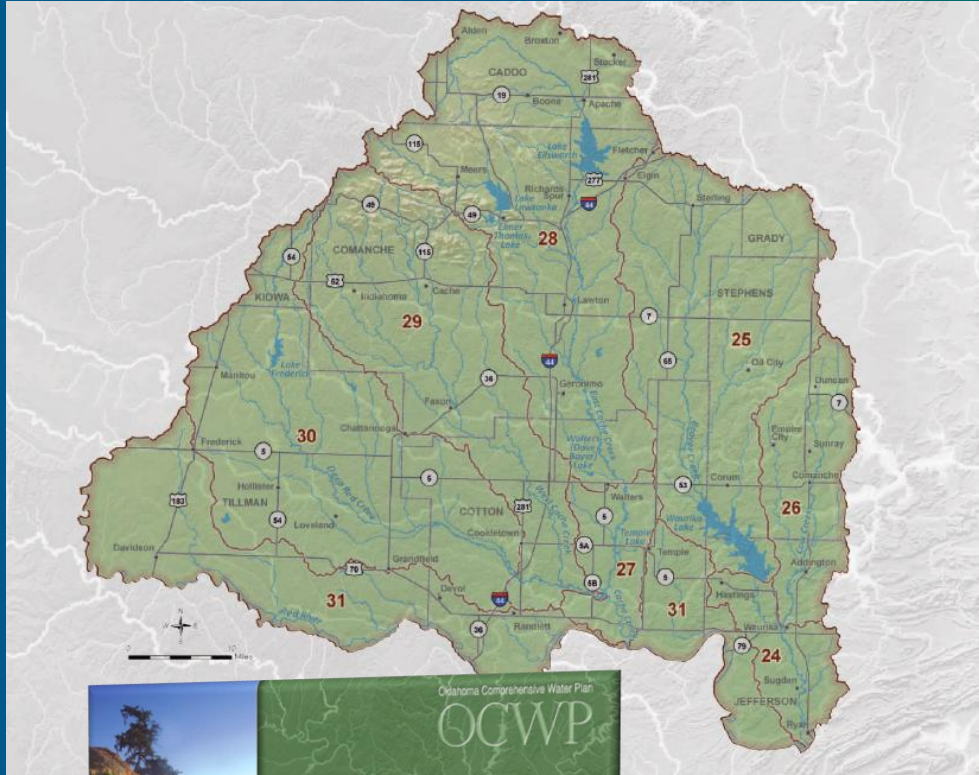
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Southwest Region



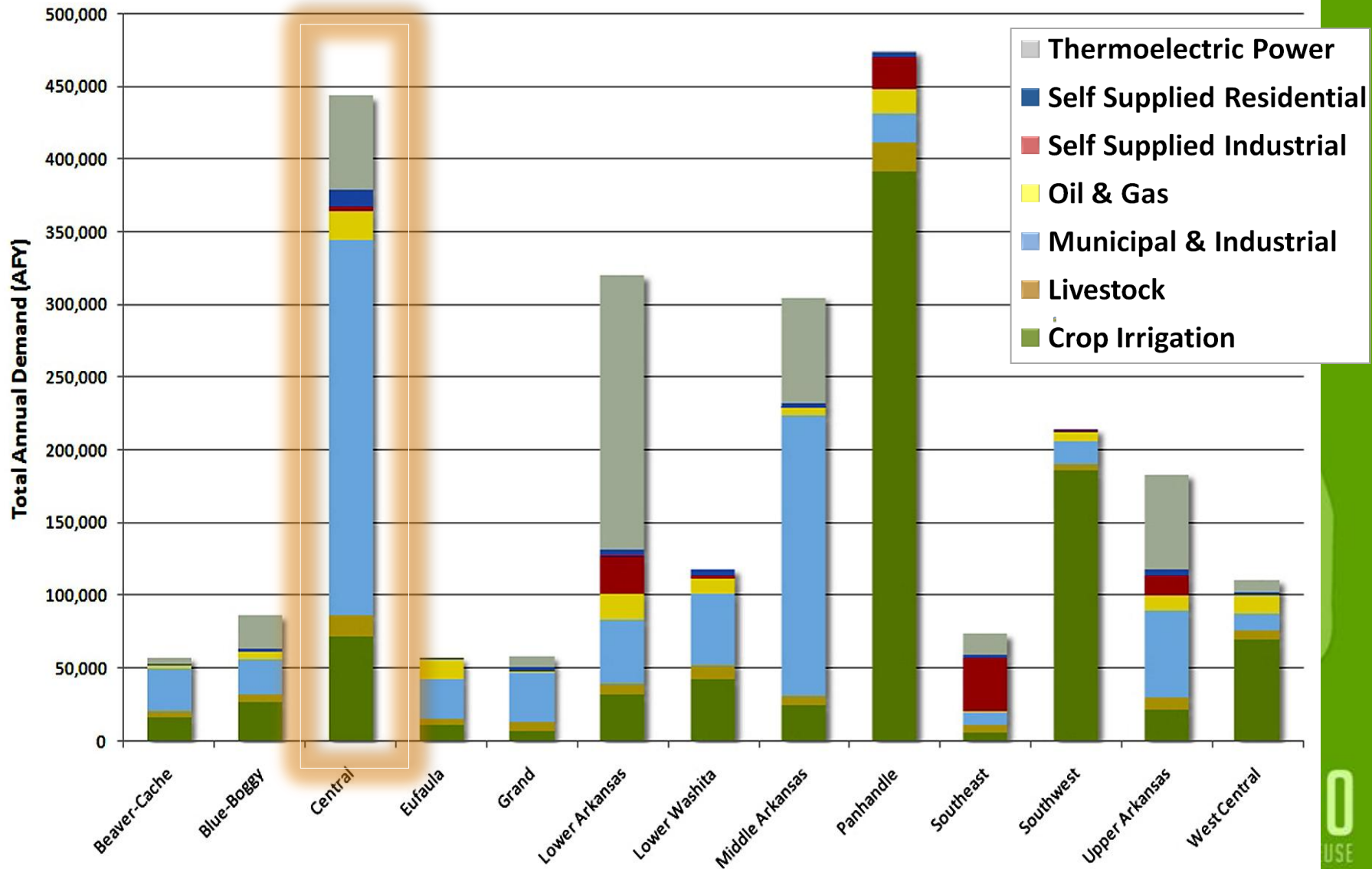
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Beaver-Cache and Lower Washita Regions



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2060 Water Demands By Region



OCWP Public/Stakeholder Participation and Policy Development

- Hundreds of stakeholder and citizen meetings to fine-tune study results as well as develop solutions to Oklahoma's most pressing water issues.

- Local and Regional Input Meetings
- Water Law/Science Seminars
- Stakeholder Meetings
- Planning Workshops
- Legislative Workgroups
- Academy Town Hall
- Feedback/Implementation Meetings

“Big 8” Priority Recommendations



Infrastructure Financing



Conservation, Reuse, Recycling



Monitoring



Supply Reliability



Instream Flows



Excess/Surplus



State/Tribal Resolution

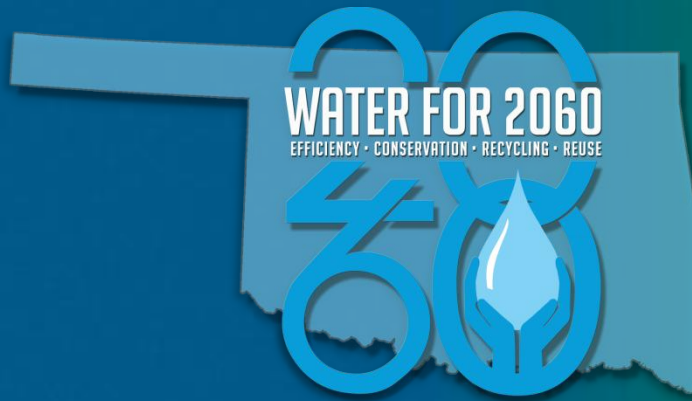


Regional Planning



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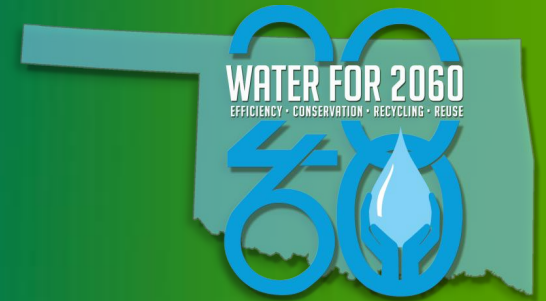
What is Water for 2060?



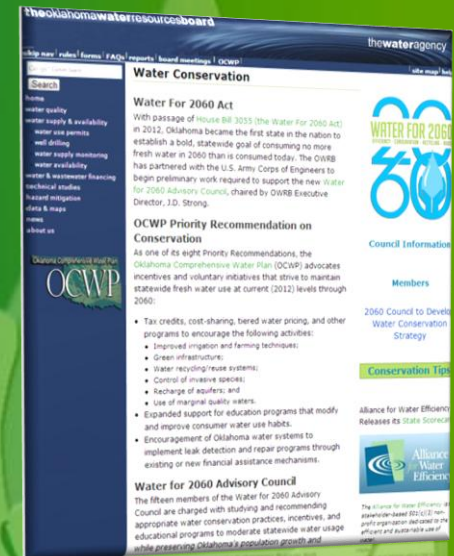
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Water for 2060

- Water for 2060 Act sets statewide goal of consuming no more fresh water in 2060 than we consume today.
- Created through passage of HB 3055 in 2012.
- Advisory Council appointed to recommend **incentives and voluntary initiatives** to maintain statewide fresh water use at current levels through 2060.



www.owrb.ok.gov/2060



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Water for 2060 Advisory Council Responsibilities

**Recommend incentives for
efficient use/reuse**

**Recommendations regarding
expansion of consumer water-use
education programs**

**Enhance existing or develop new
financial assistance programs**

**Submit Final Report to
Legislature by November 1, 2015**

Agenda

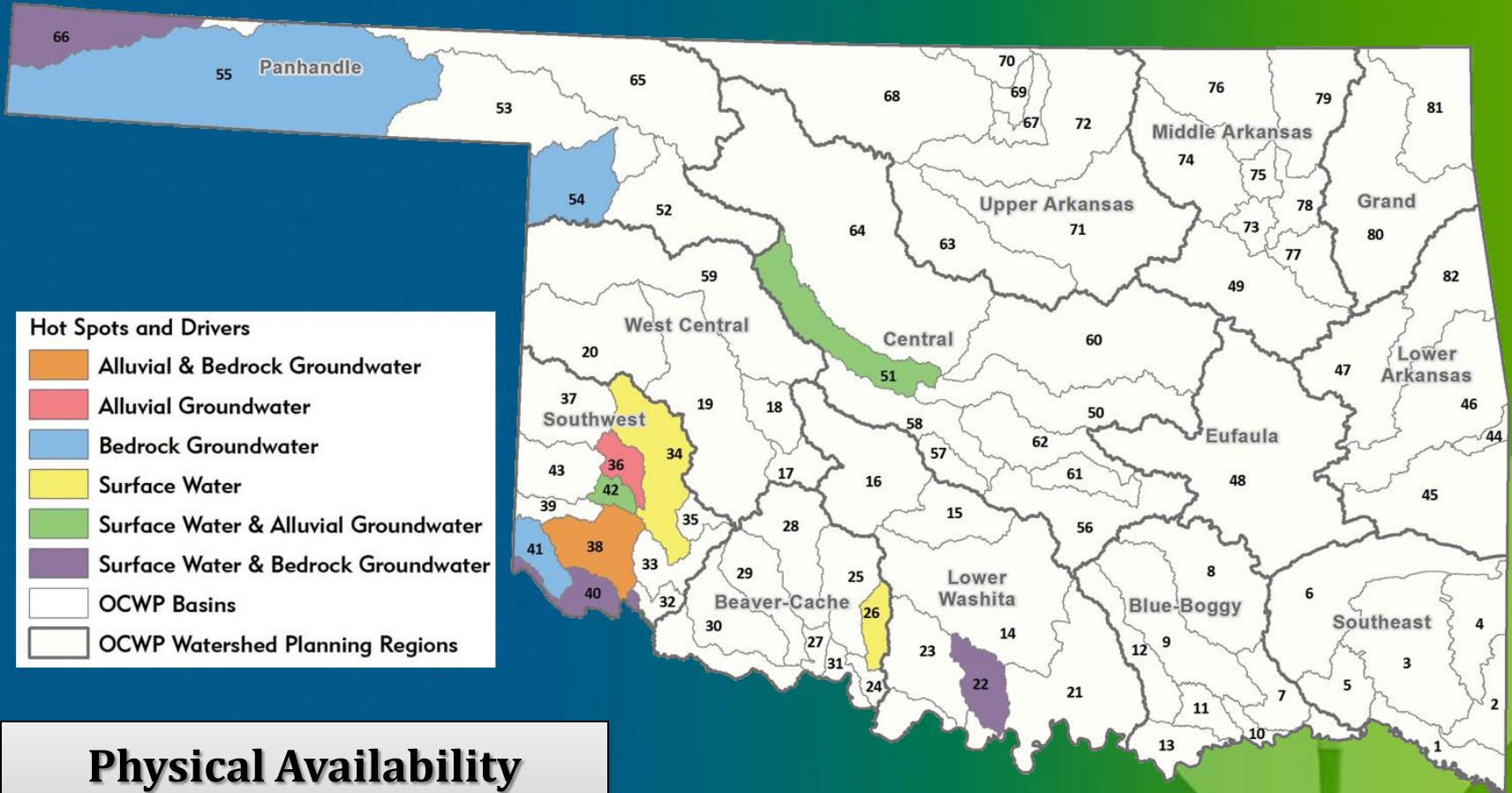
- Welcome
- Presentation
 - Hot Spot Basins
 - Overview of Hot Spot Basins in this Area
 - Current and upcoming Water for 2060 activities
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Goals for Tonight's Meeting

- Common understanding of Water for 2060 background and goals
- Consider water efficiency options that could help satisfy future water demands
- Work toward reducing water shortages in Hot Spot basins and Water for 2060 goals
- Get input on local opportunities for conservation, marginal quality water use, and regionalization

Hot Spot Basins

12 basins with most significant supply challenges



Physical Availability
Permit Availability
Water Quality

Overview of Hot Spot Basins: Panhandle Region

Metric	Basin 54	Basin 55	Basin 66
2060 Total Demand (AFY)	30,400	312,929	22,483
Source of Supply (% Groundwater / Surface Water)	99/<1	99/<1	92/8
2060 Potential Shortages in Surface Water & Alluvial Groundwater (AFY)	540	700	420
	<i>Shortages will occur most years</i>		
2060 Bedrock Groundwater Depletions (AFY)	9,260	47,090	5,230

Pumping costs will increase over time

Overview of Hot Spot Basins: Southwest Region

Metric	Basin 34	Basin 36	Basin 38	Basin 40	Basin 41	Basin 42
2060 Total Demand (AFY)	19,014	6,600	83,563	19,186	33,064	7,062
Source of Supply (% Groundwater / Surface Water)	52/48	99/1	38/62	92/8	99/1	81/19
2060 Potential Shortages in Surface Water & Alluvial Groundwater (AFY)	2,970	2,560	5,480	1,060	910	2,920
	<i>Shortages will occur most years</i>					
2060 Bedrock Groundwater Depletions (AFY)	0	0	2,260	870	2,420	440

Overview of Hot Spot Basins: Beaver-Cache/Lower Washita Regions

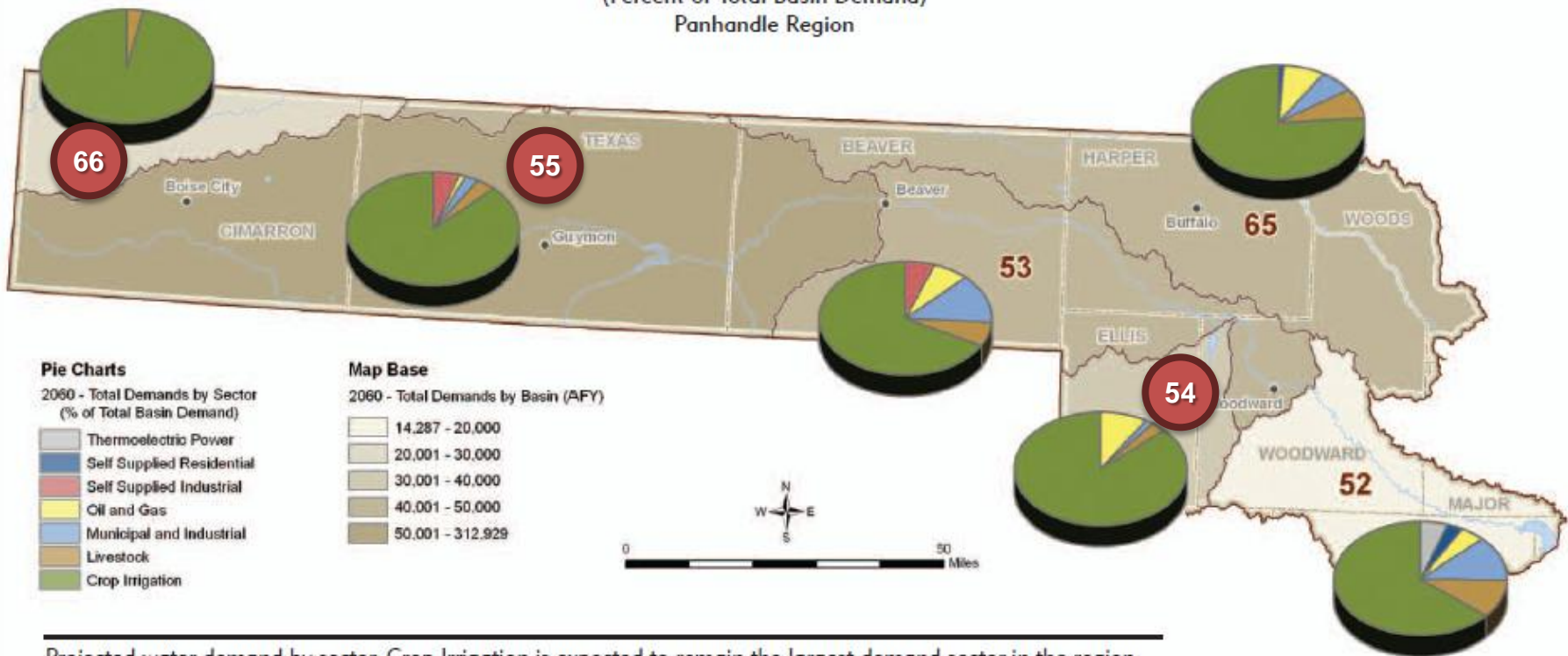
Metric	Basin 22	Basin 26
2060 Total Demand (AFY)	8,746	3,331
Source of Supply (% Groundwater / Surface Water)	23/77	57/43
2060 Potential Shortages in Surface Water & Alluvial Groundwater (AFY)	950 <i>Shortages will occur most years</i>	110
2060 Bedrock Groundwater Depletions (AFY)	920	290

Overview of Hot Spot Basins: Central Region

Metric	Basin 51
2060 Total Demand	27,750 AFY
Source of Supply	32% Surface Water 59% Alluvial Groundwater 9% Bedrock Groundwater
2060 Potential Shortages:	<i>Shortages will occur most years</i>
- Surface Water	1,590 AFY
- Alluvial Groundwater	2,810 AFY
	<i>Up to 20% of demand</i>
2060 Bedrock Groundwater Depletions	100 AFY

Projected Water Demands

Total 2060 Water Demand by Sector and Basin
(Percent of Total Basin Demand)
Panhandle Region



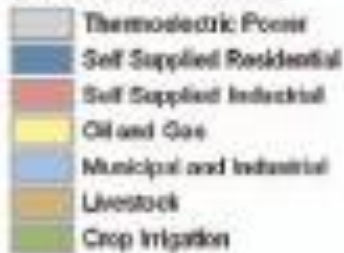
Projected water demand by sector. Crop Irrigation is expected to remain the largest demand sector in the region, accounting for 82% of the total regional demand in 2060.

Hot Spot basin

Projected Water Demands

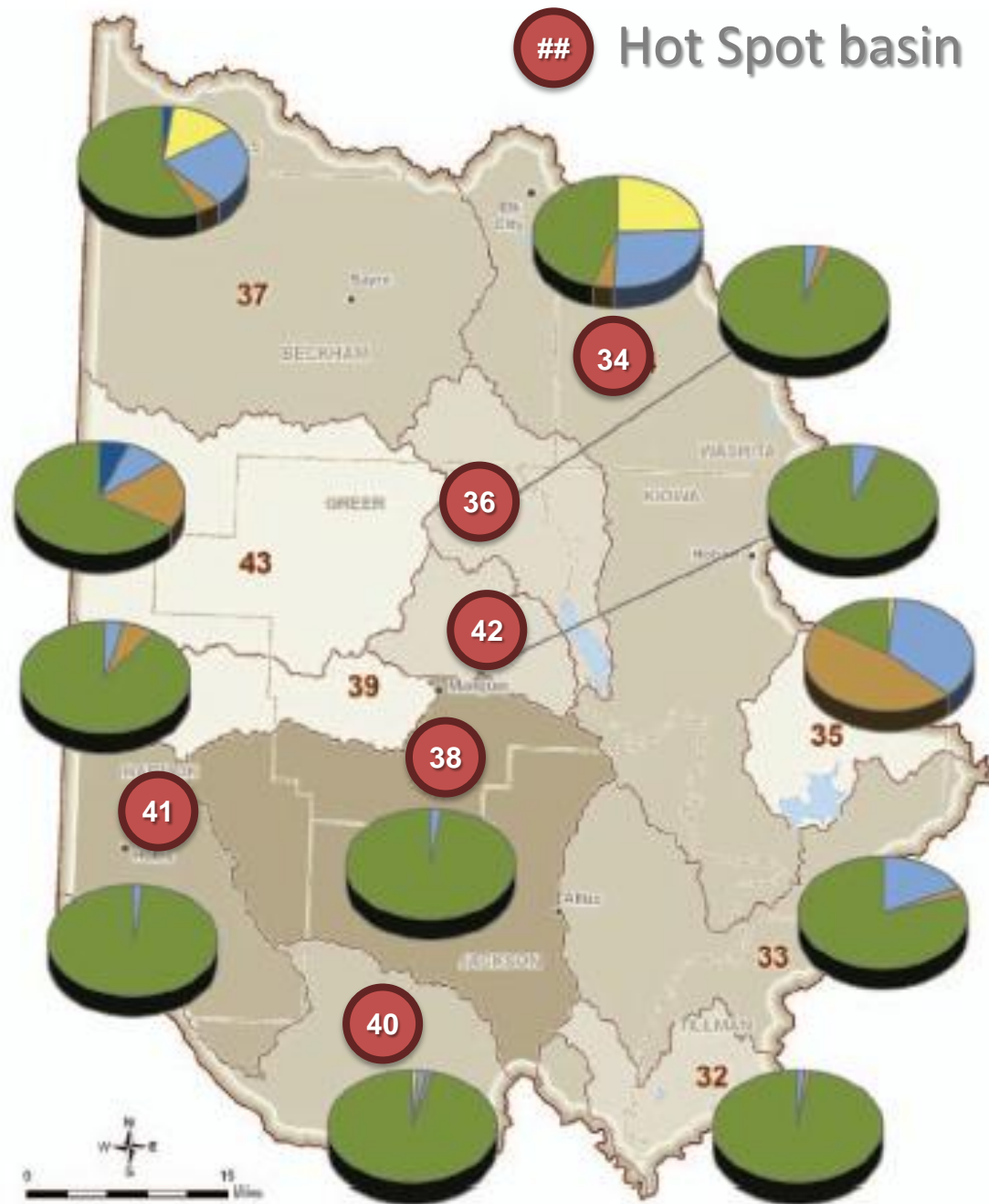
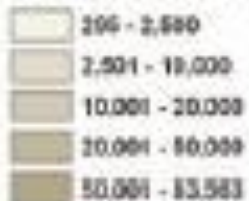
Pie Charts

2000 - Total Demands by Sector
(% of Total Basin Demand)

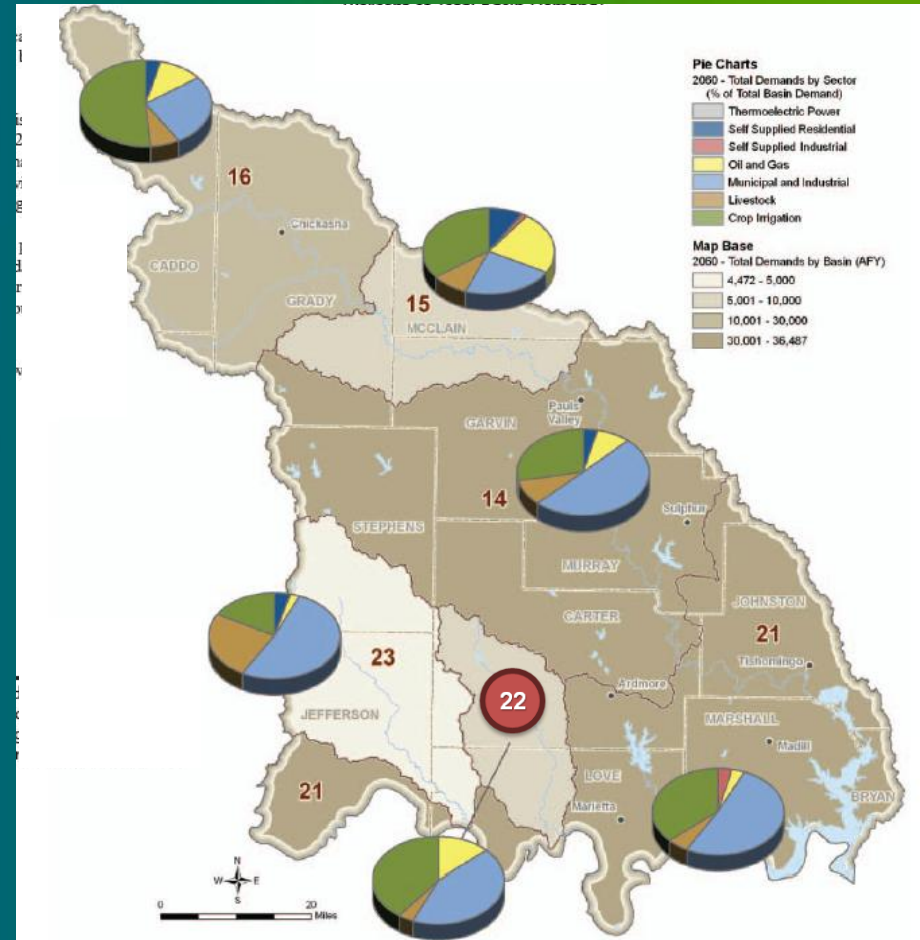
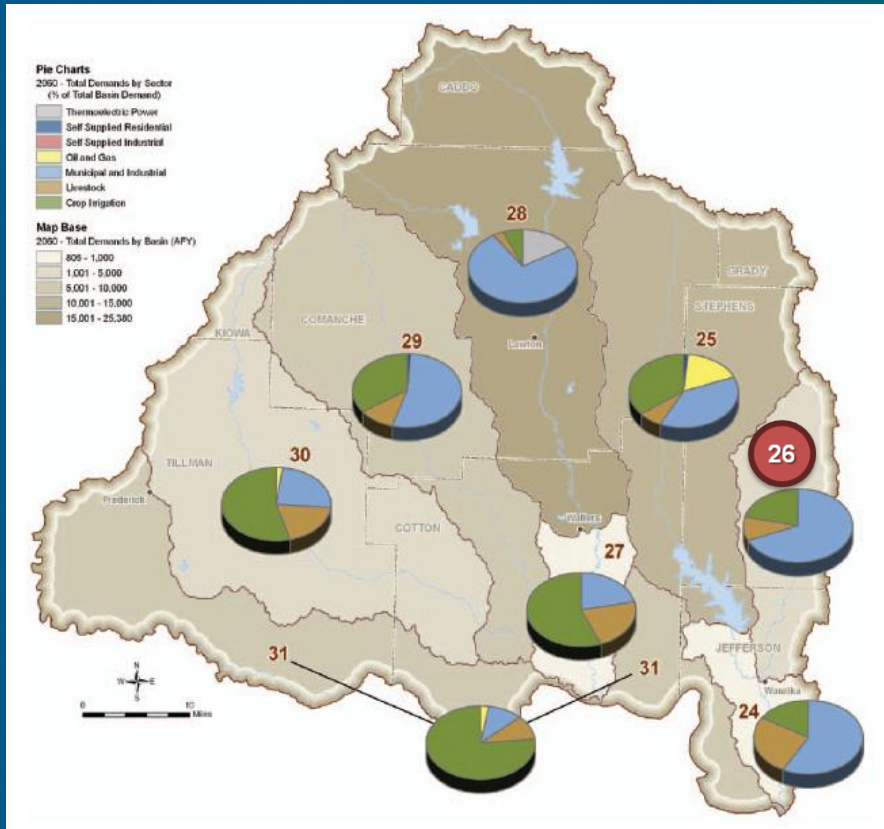


Map Base

2000 - Total Demands by Basin (AFY)



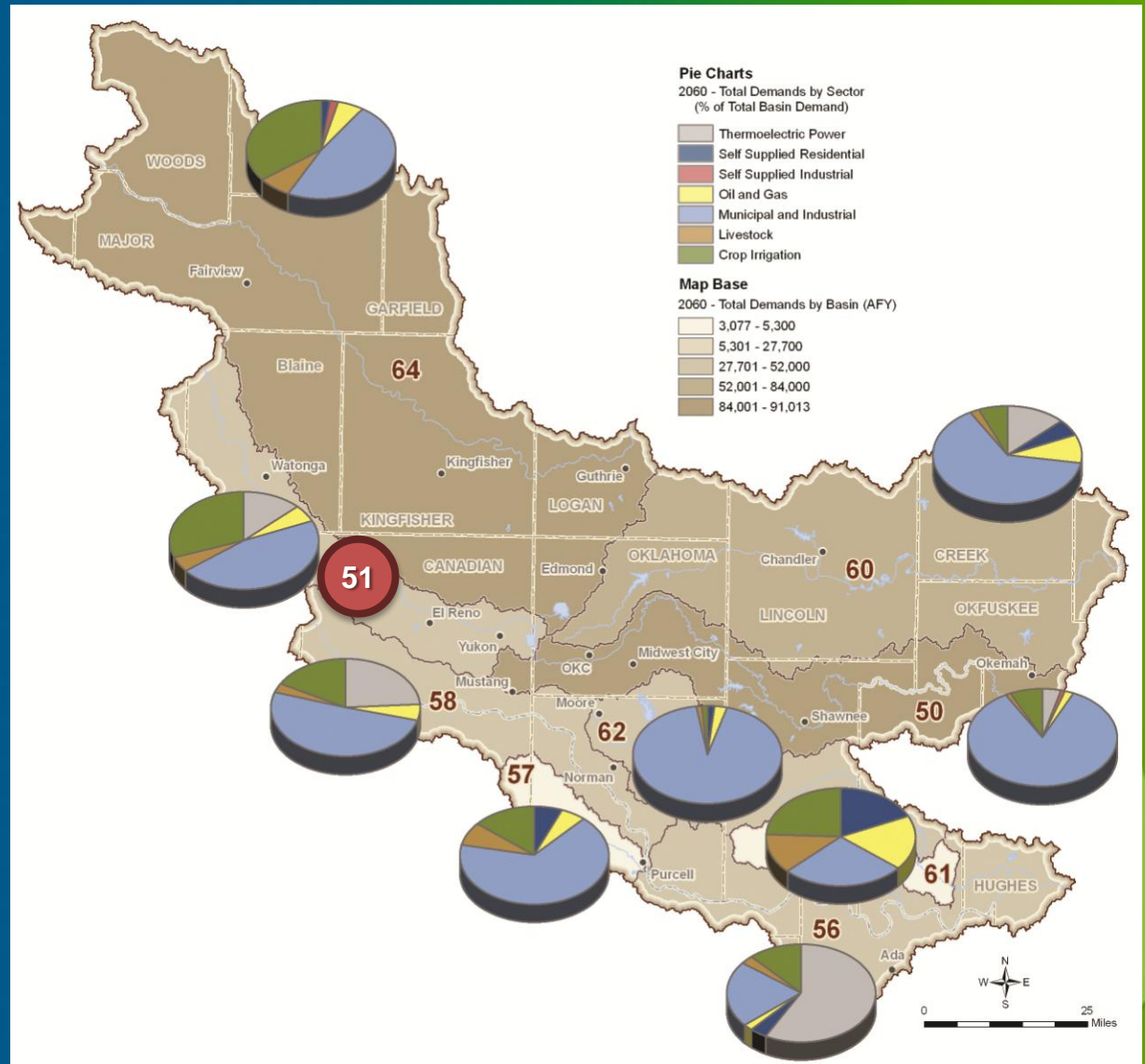
Projected Water Demands



Hot Spot basin

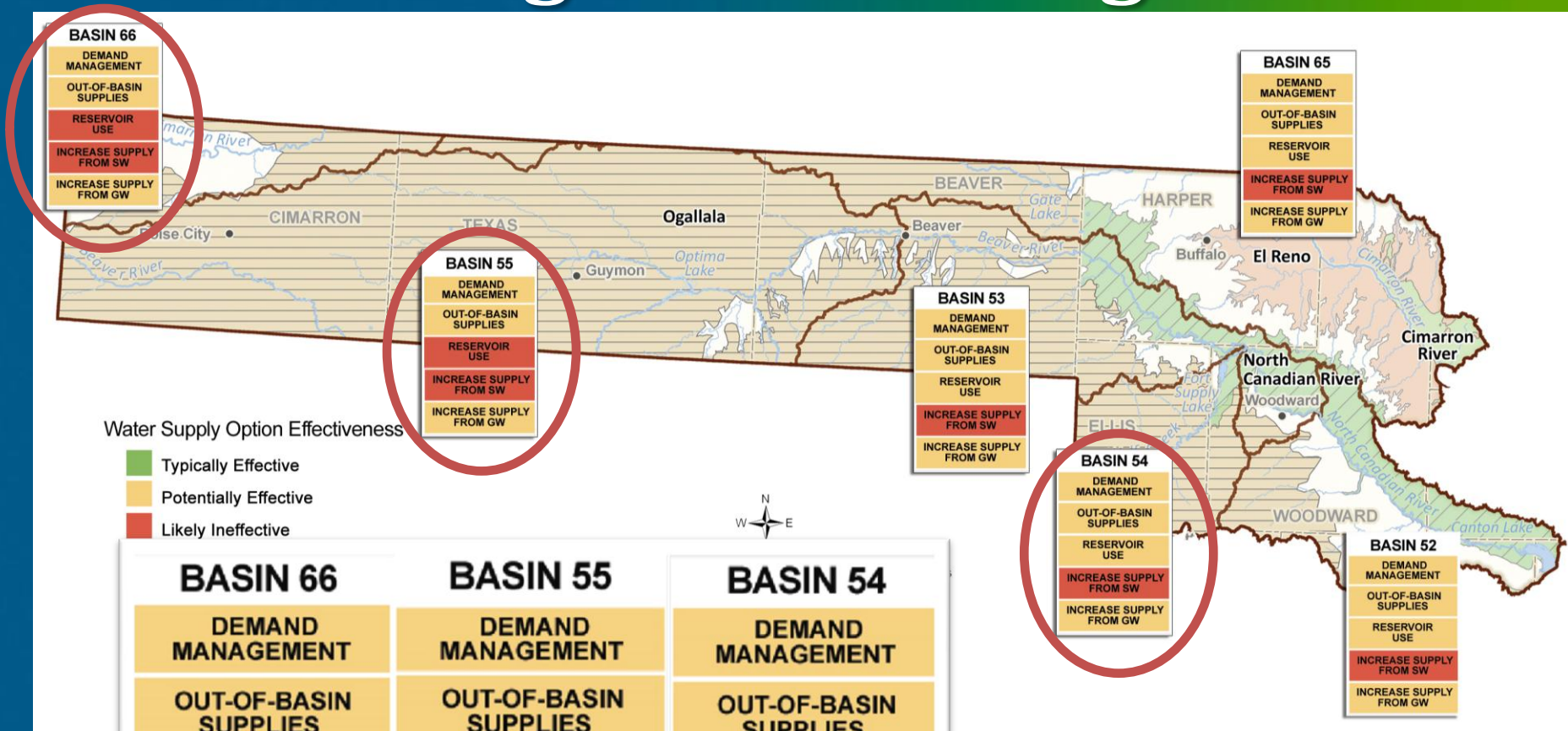
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Projected Water Demands

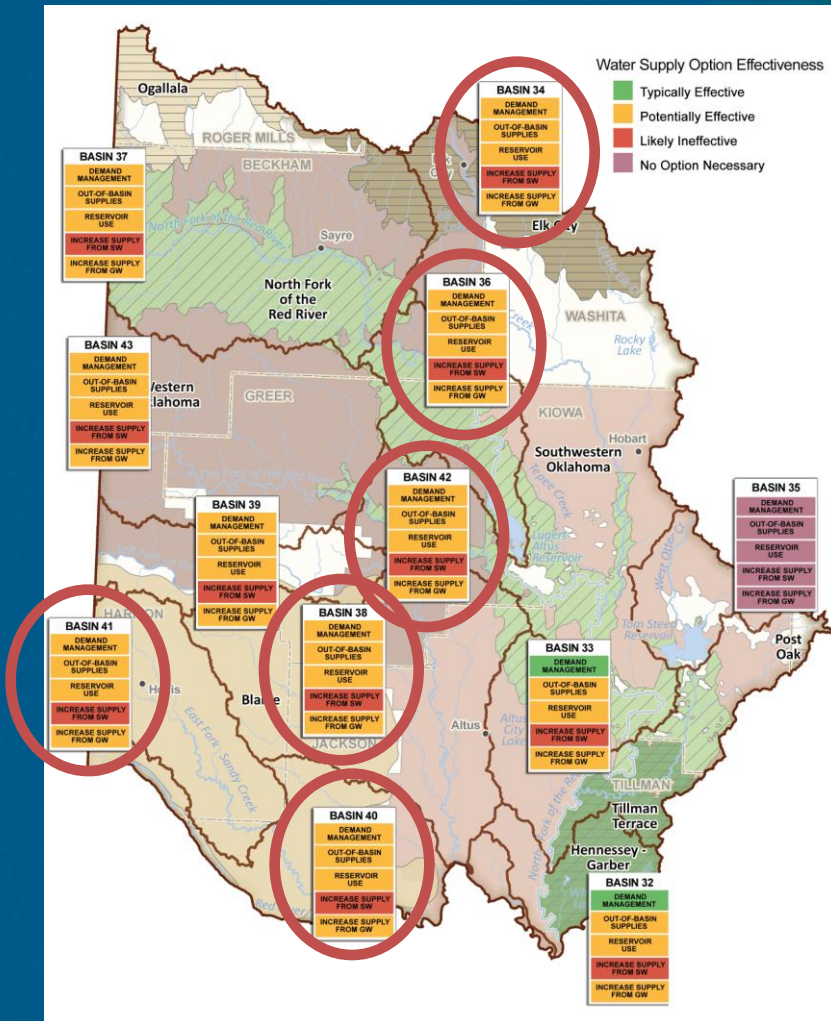


Hot Spot basin

Feasibility of Supplies and Water Management Strategies

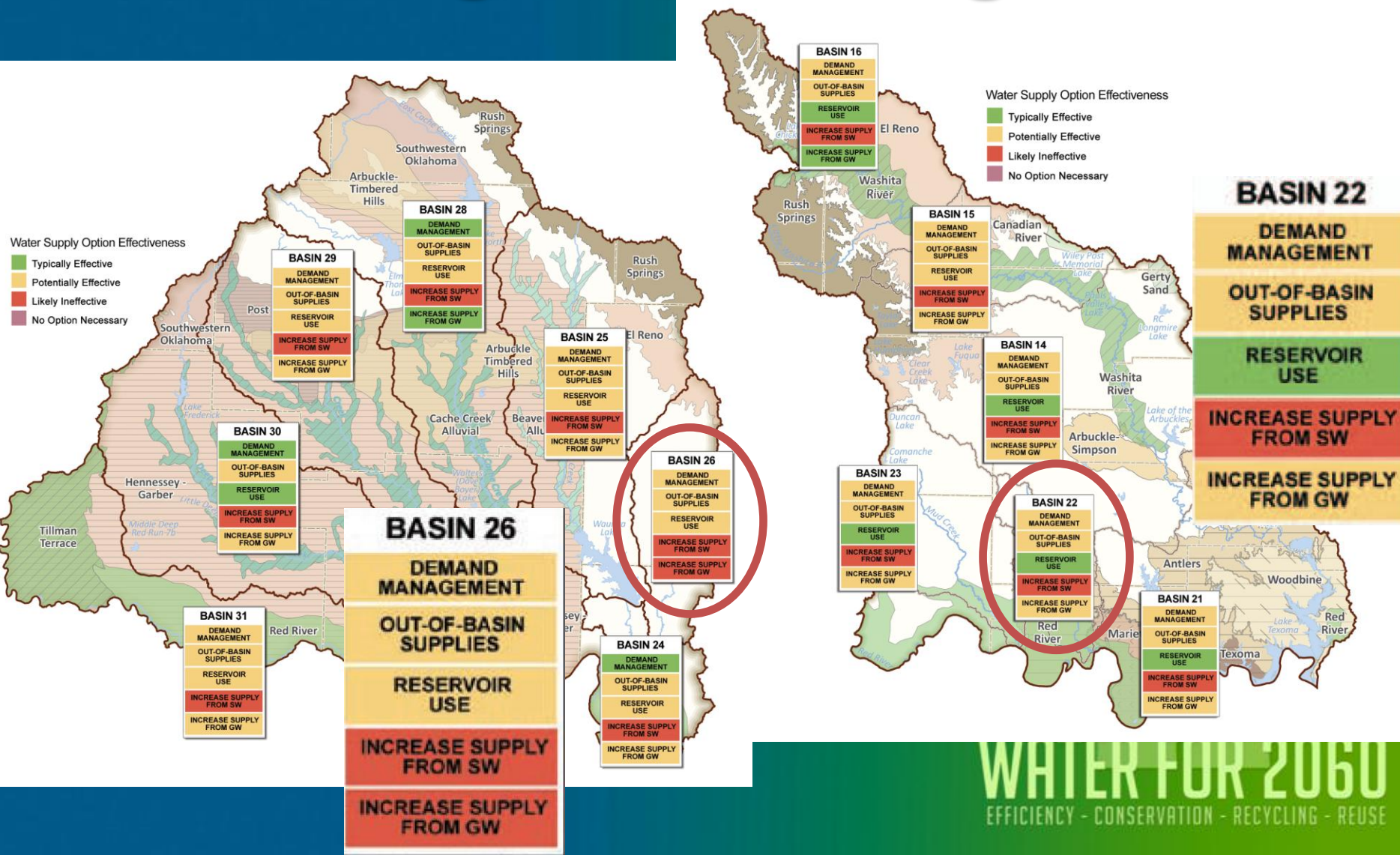


Feasibility of Supplies and Water Management Strategies

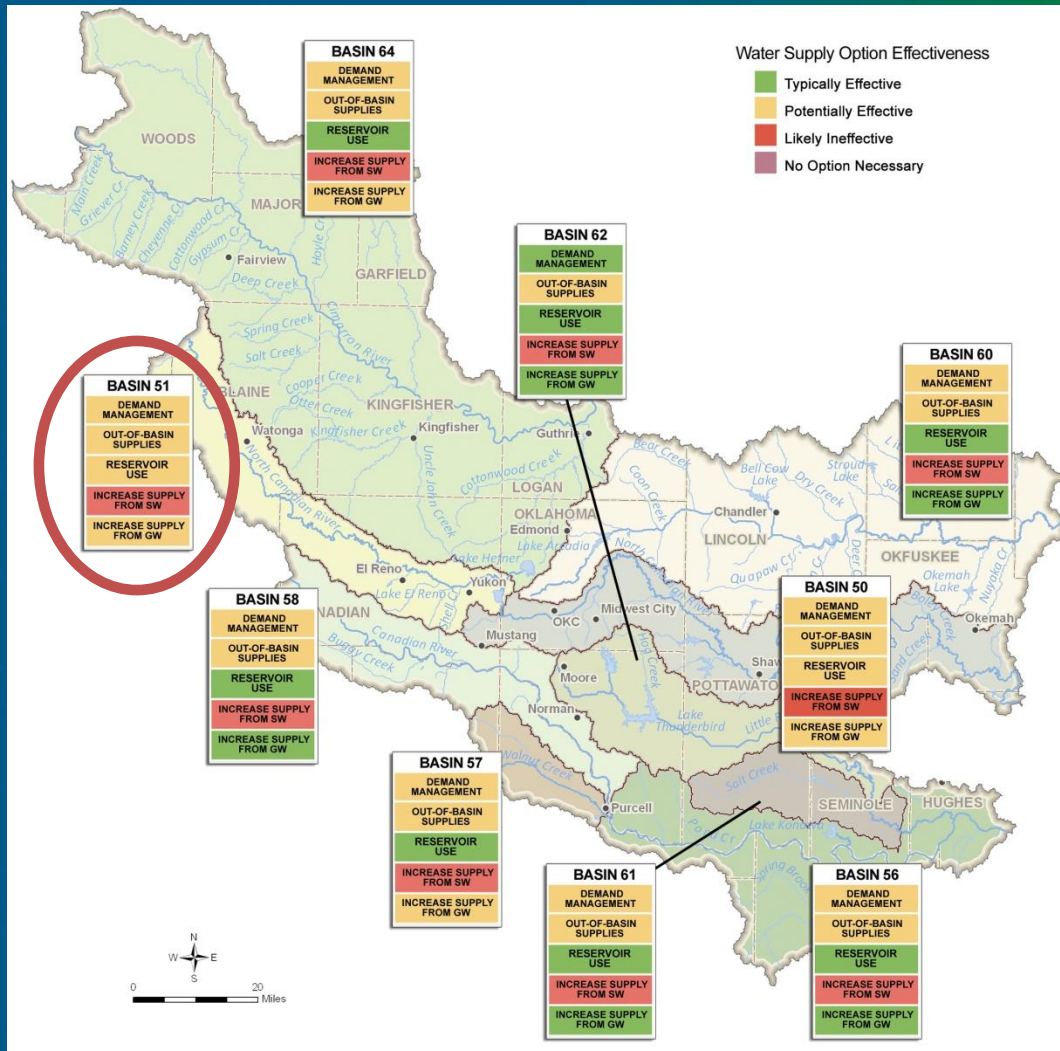


BASIN 42	BASIN 36	BASIN 34
DEMAND MANAGEMENT	DEMAND MANAGEMENT	DEMAND MANAGEMENT
OUT-OF-BASIN SUPPLIES	OUT-OF-BASIN SUPPLIES	OUT-OF-BASIN SUPPLIES
RESERVOIR USE	RESERVOIR USE	RESERVOIR USE
INCREASE SUPPLY FROM SW	INCREASE SUPPLY FROM SW	INCREASE SUPPLY FROM SW
INCREASE SUPPLY FROM GW	INCREASE SUPPLY FROM GW	INCREASE SUPPLY FROM GW
BASIN 41	BASIN 38	BASIN 40
DEMAND MANAGEMENT	DEMAND MANAGEMENT	DEMAND MANAGEMENT
OUT-OF-BASIN SUPPLIES	OUT-OF-BASIN SUPPLIES	OUT-OF-BASIN SUPPLIES
RESERVOIR USE	RESERVOIR USE	RESERVOIR USE
INCREASE SUPPLY FROM SW	INCREASE SUPPLY FROM SW	INCREASE SUPPLY FROM SW
INCREASE SUPPLY FROM GW	INCREASE SUPPLY FROM GW	INCREASE SUPPLY FROM GW

Feasibility of Supplies and Water Management Strategies



Feasibility of Supplies and Water Management Strategies



BASIN 51
DEMAND MANAGEMENT
OUT-OF-BASIN SUPPLIES
RESERVOIR USE
INCREASE SUPPLY FROM SW
INCREASE SUPPLY FROM GW

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Water for 2060

Hot Spot Pilot Studies

- OWRB and Corps of Engineers
- Analyzing potential roles and effectiveness at a local level
 - Water conservation
 - Marginal quality water use
 - Regionalization of public supply systems
- Three Hot Spot basins
- Models for implementation of water efficiency statewide

Hot Spots:

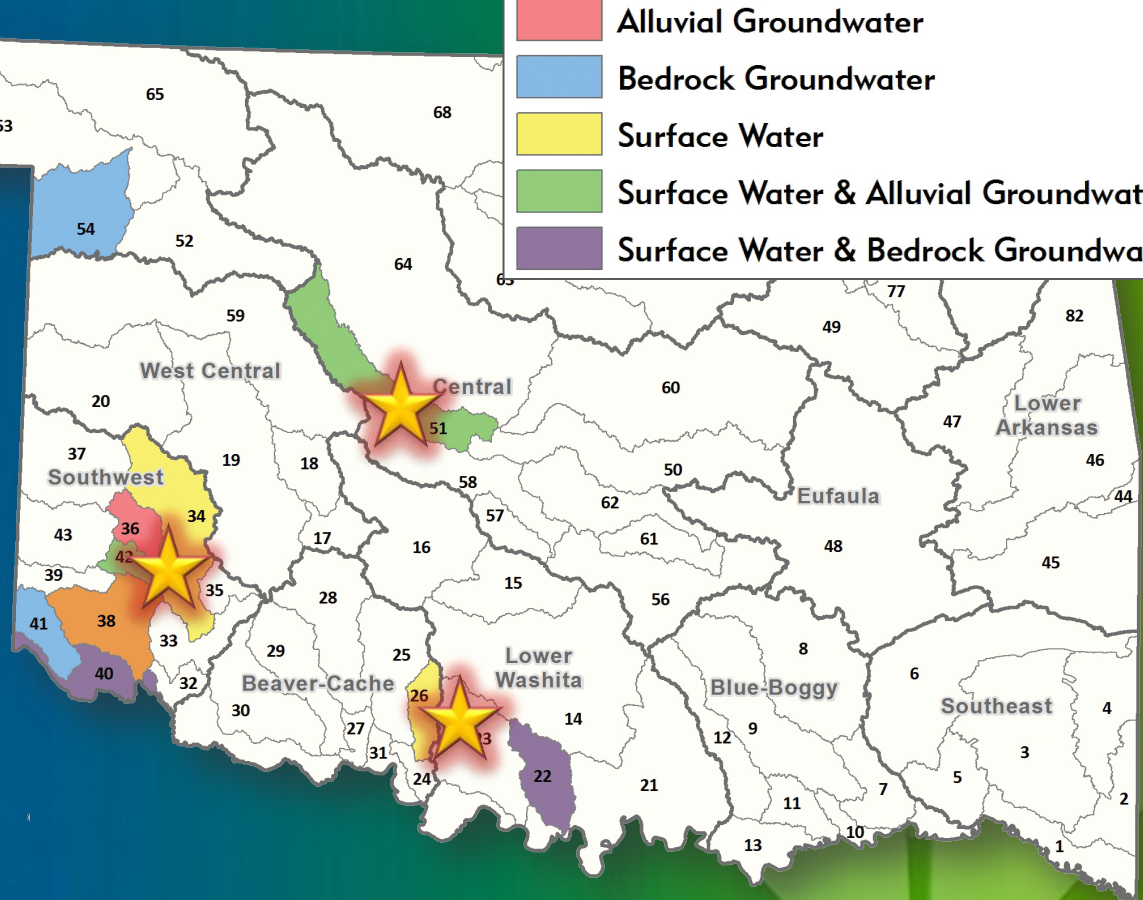
OCWP Planning Basins projected to experience the most significant water supply issues by 2060 (shortages, permit availability, and water quality).

Water for 2060 Hot Spot Pilot Studies



★ Public meetings in western Oklahoma (Spring 2014) to collect input on implementation of most appropriate conservation measures

- Analyses conducted later in 2014



OCWP "Hot Spots"

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Water for 2060

Hot Spot Efficiency Studies

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

A large, stylized green graphic of two hands cupping a water droplet is positioned on the right side of the slide.

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October 2010

Onset of the Oklahoma Drought

Intensity:



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

Author:

Staff

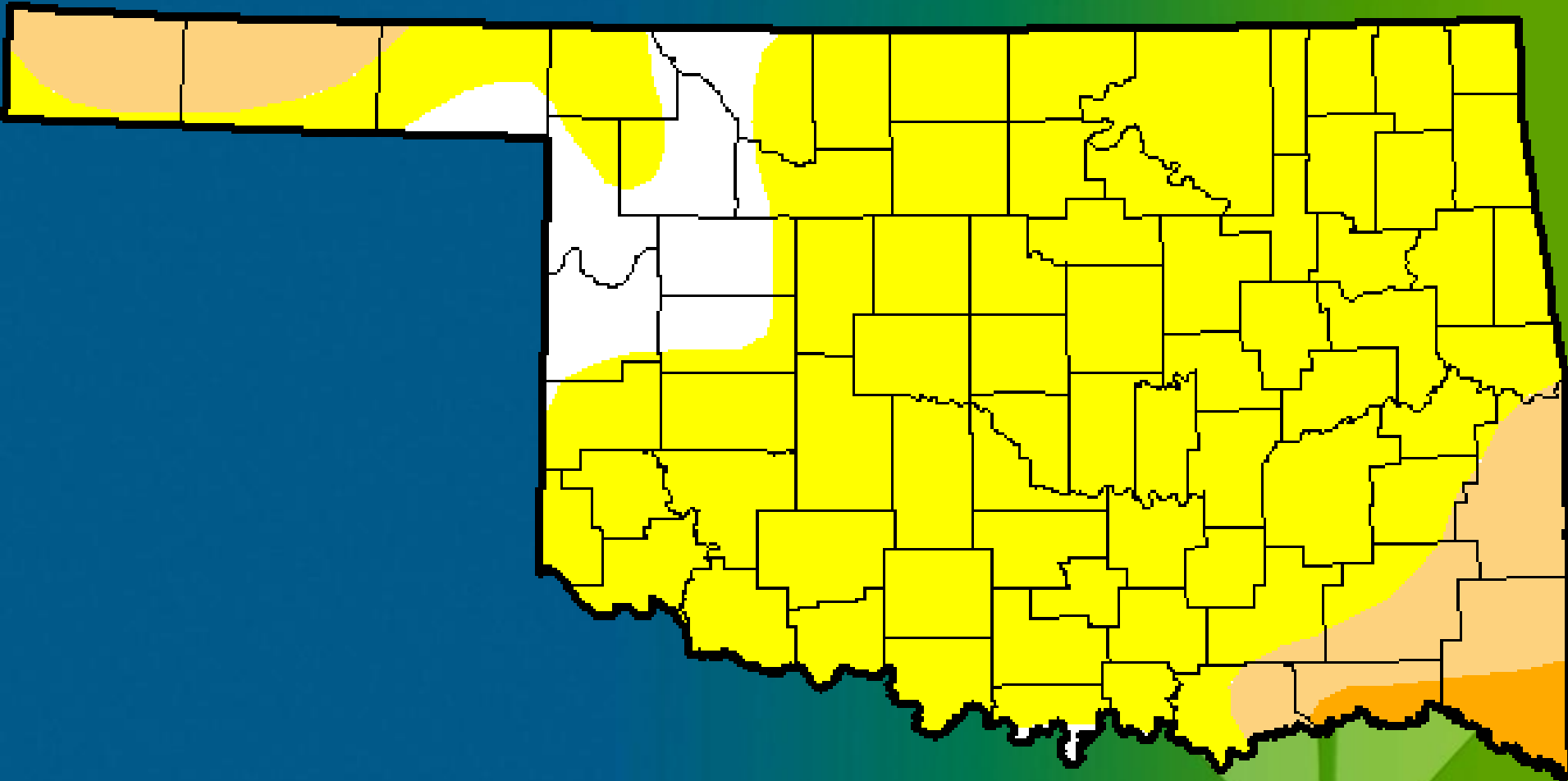
National Drought Mitigation Center



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

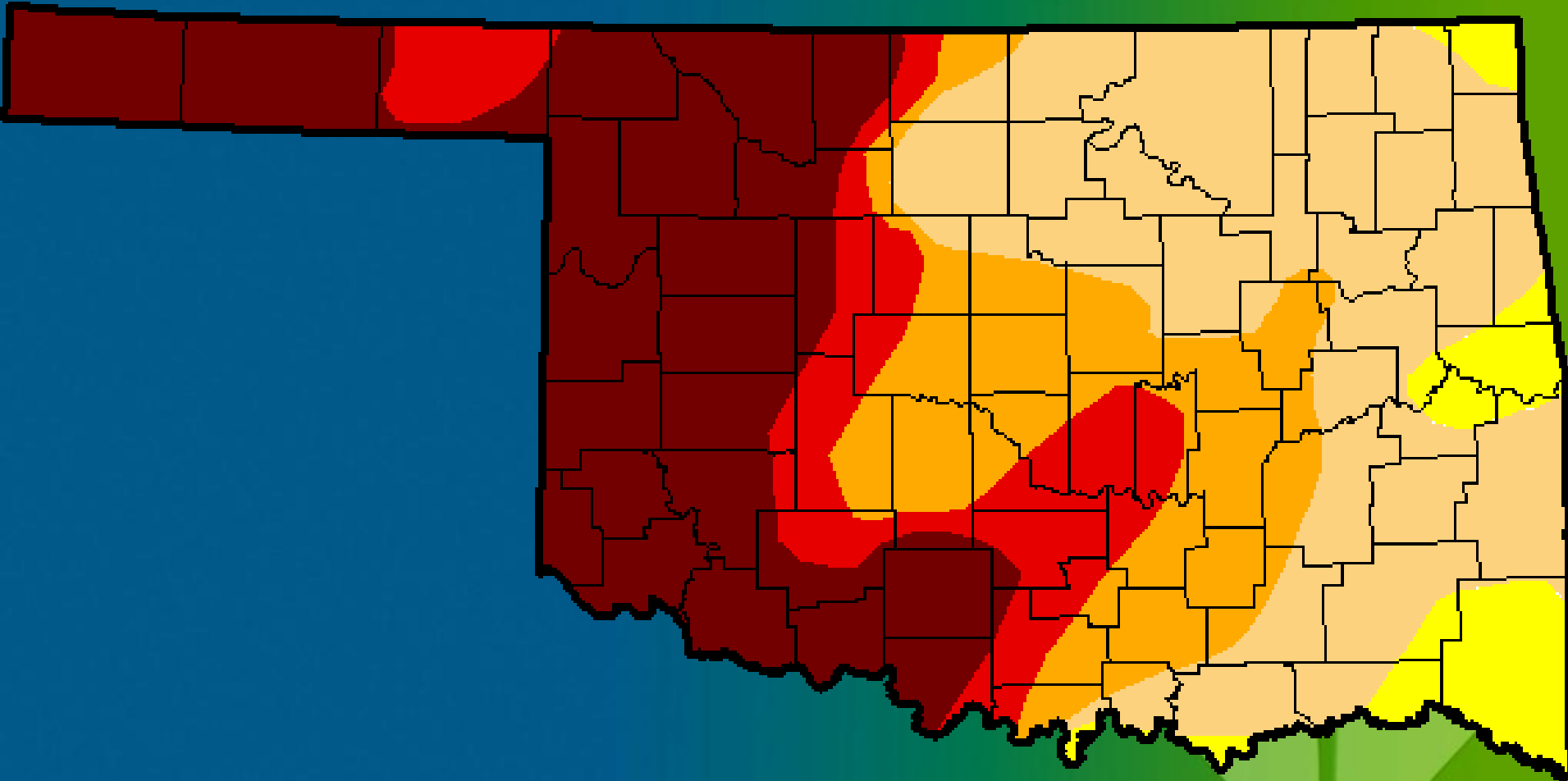
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January 2011



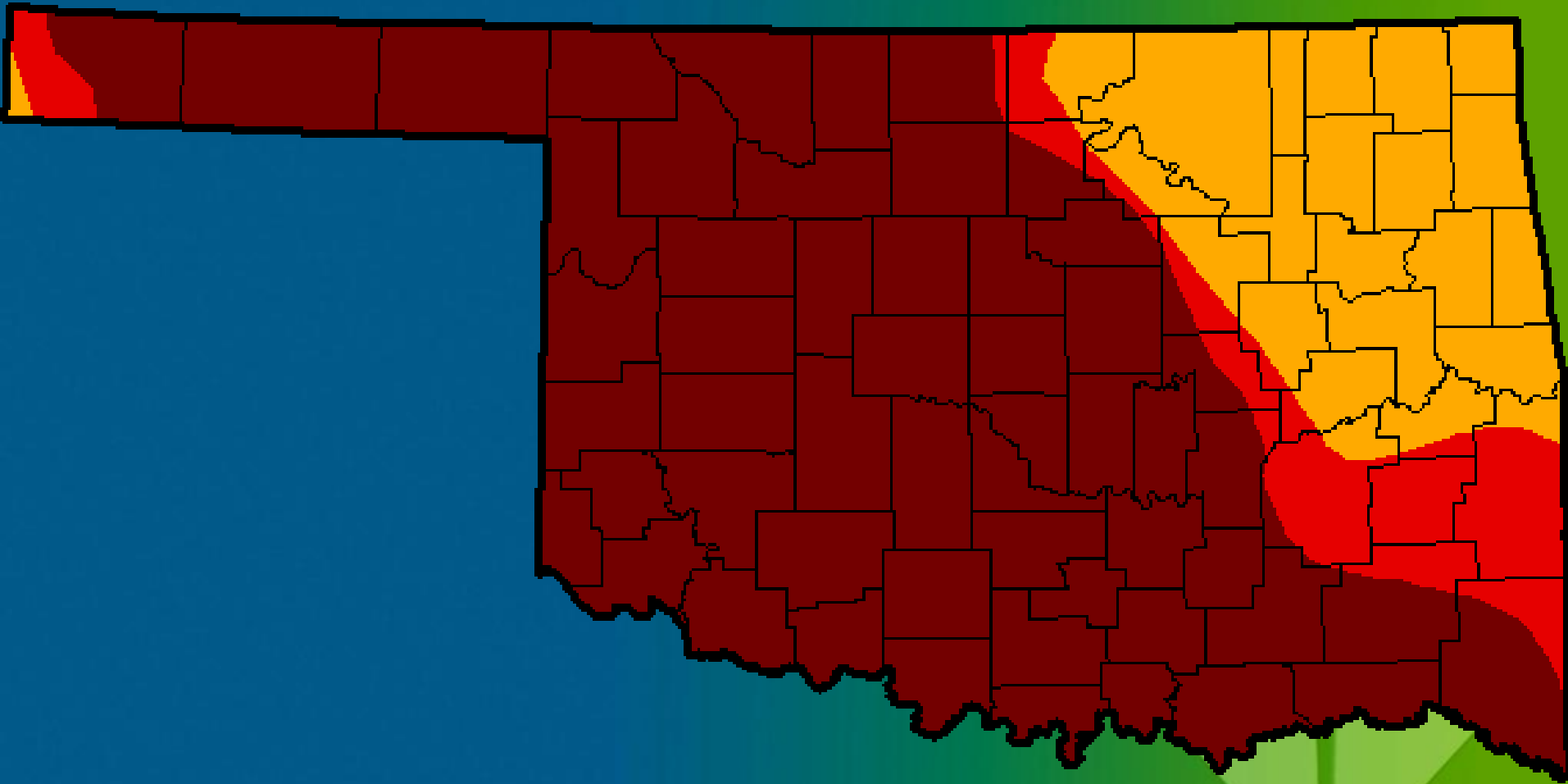
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July 2011



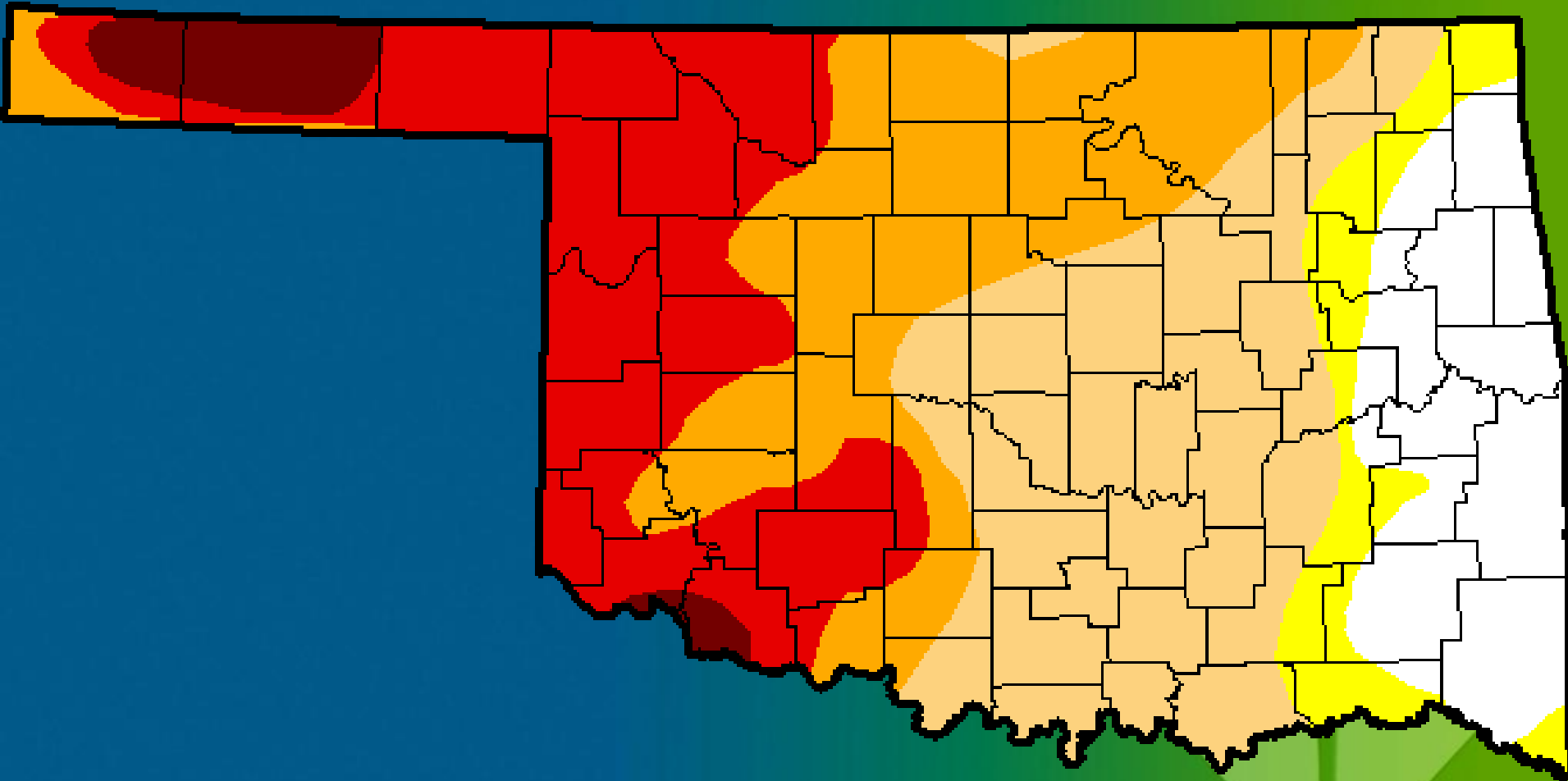
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October 2011



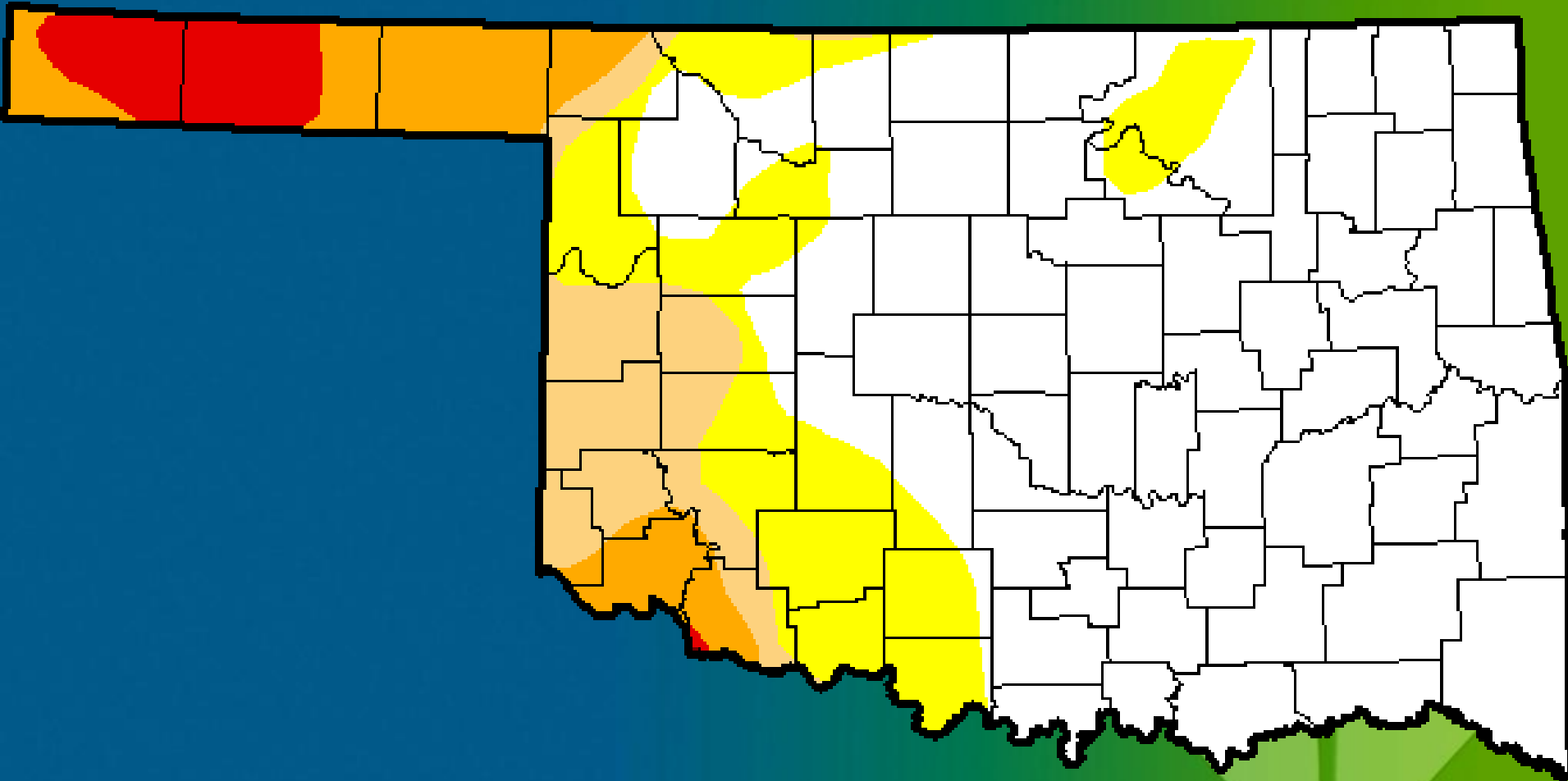
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January 2012



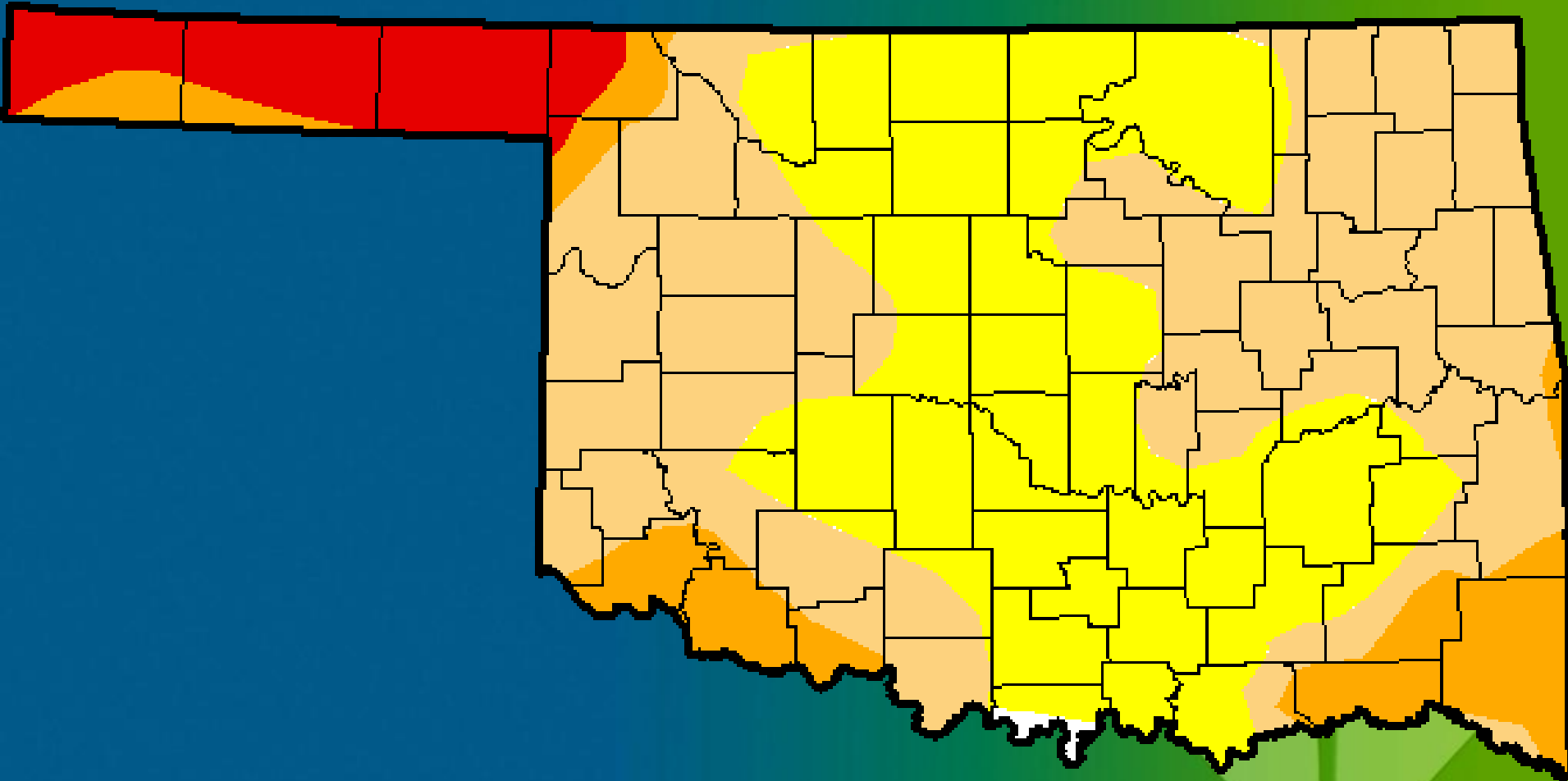
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April 2012



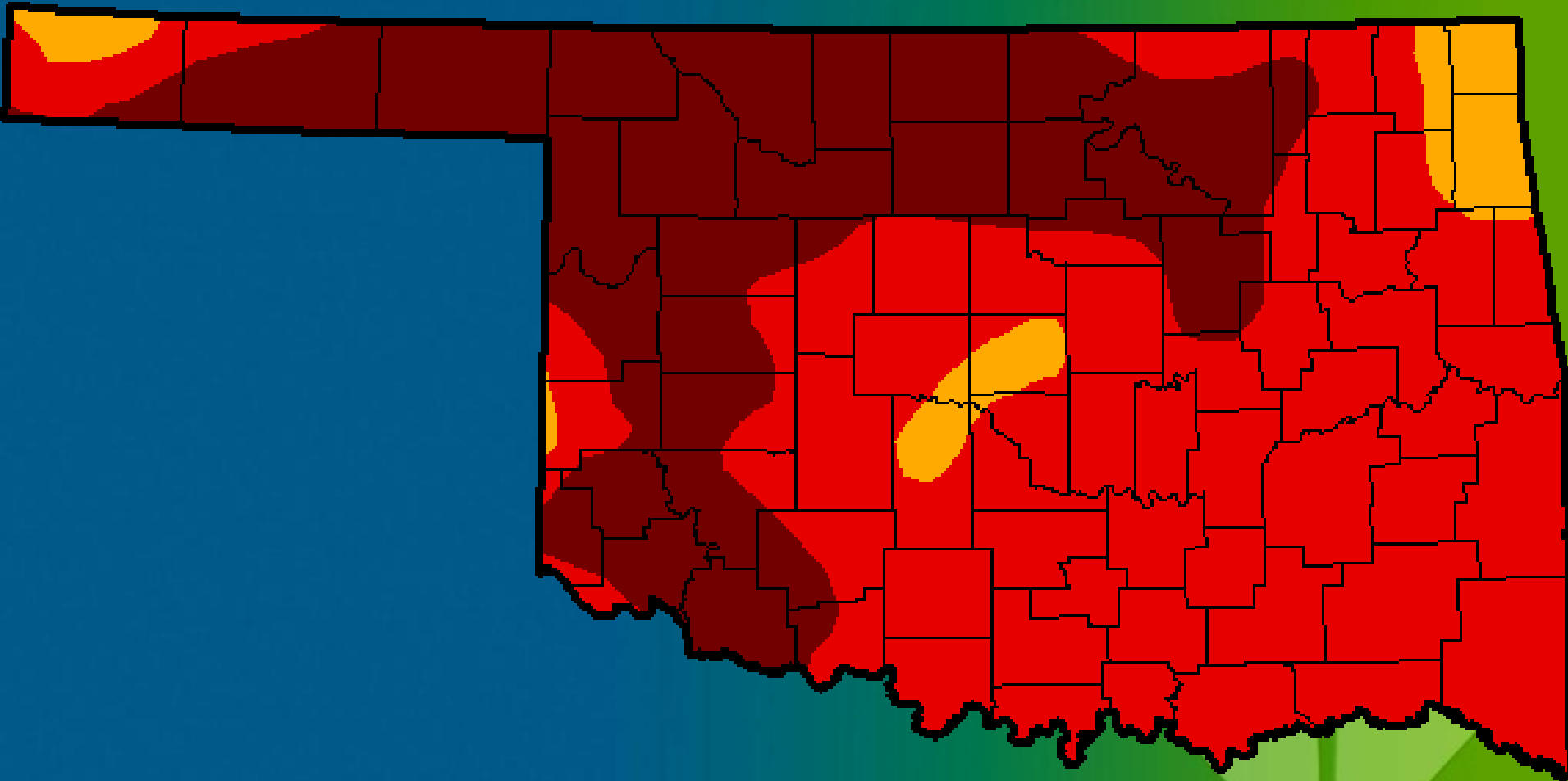
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July 2012



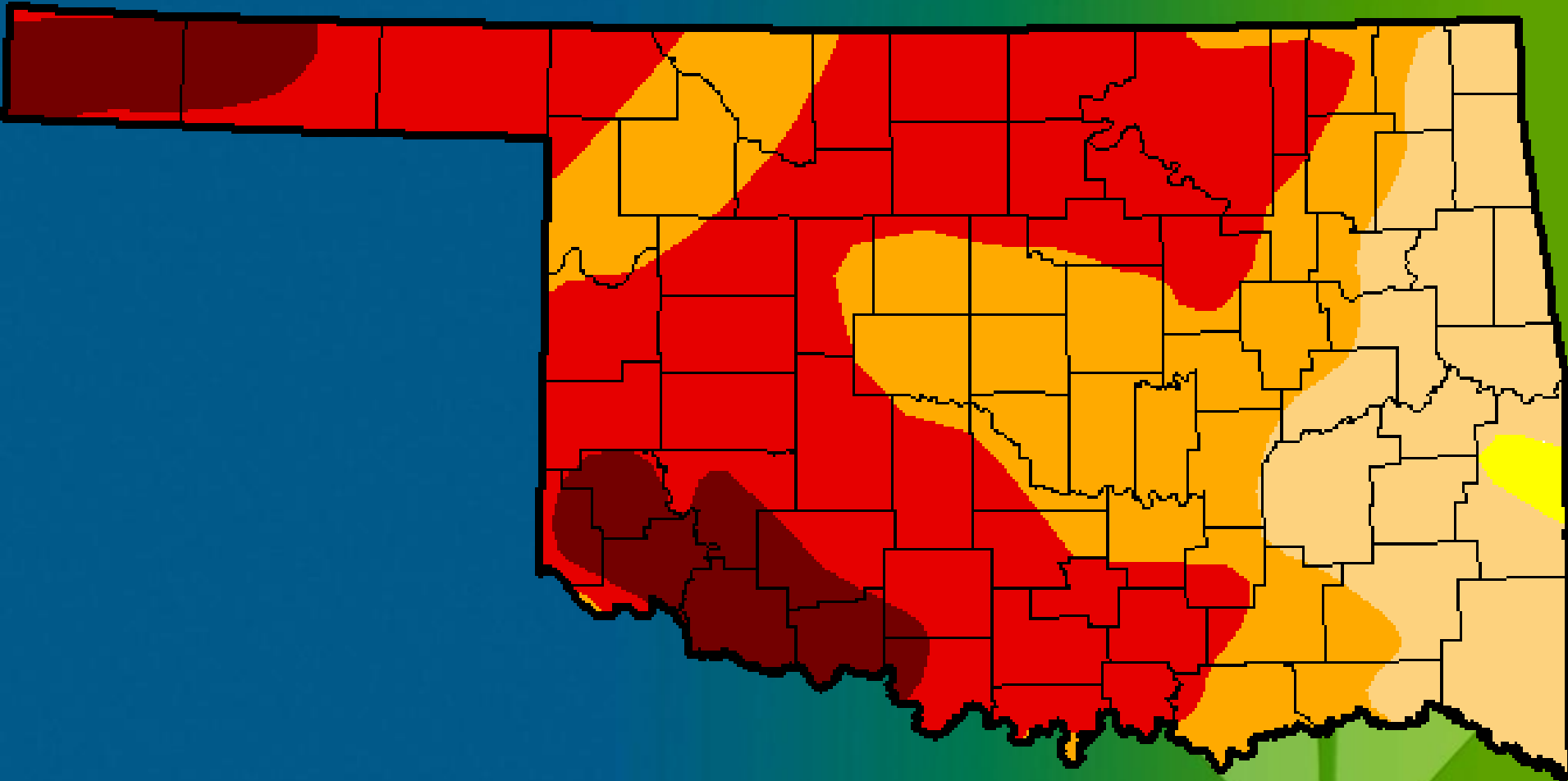
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January 2013



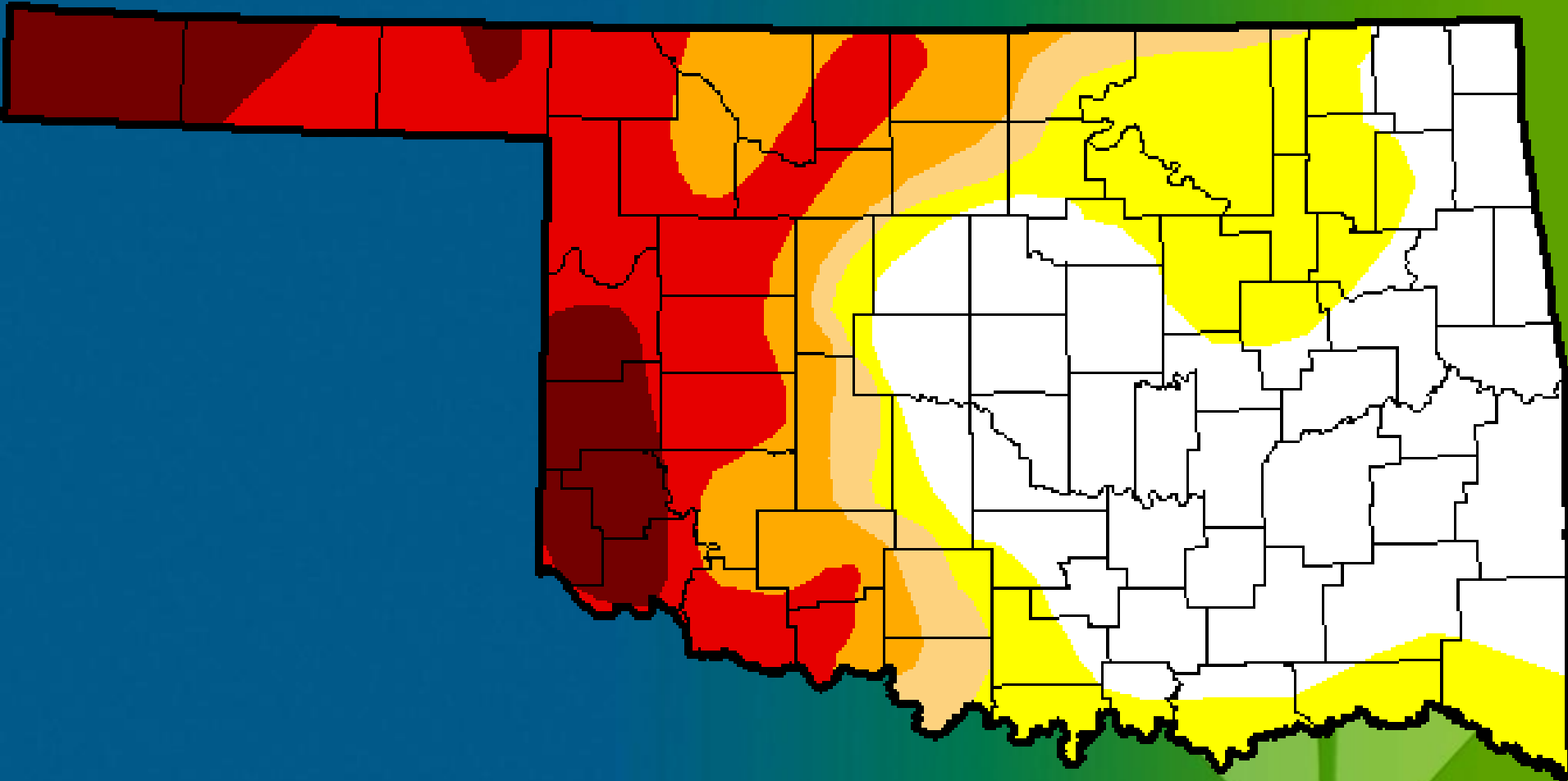
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April 2013



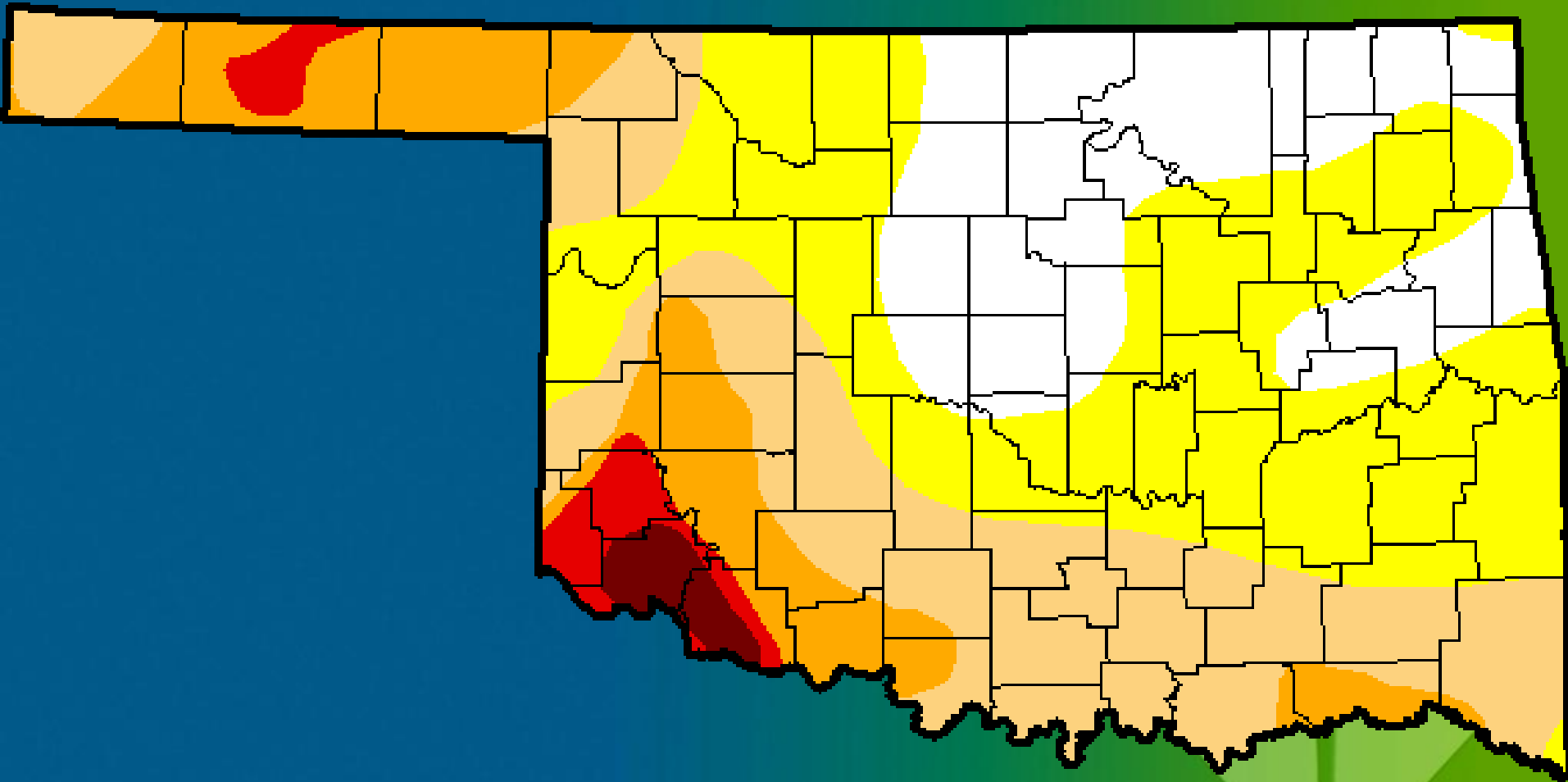
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July 2013



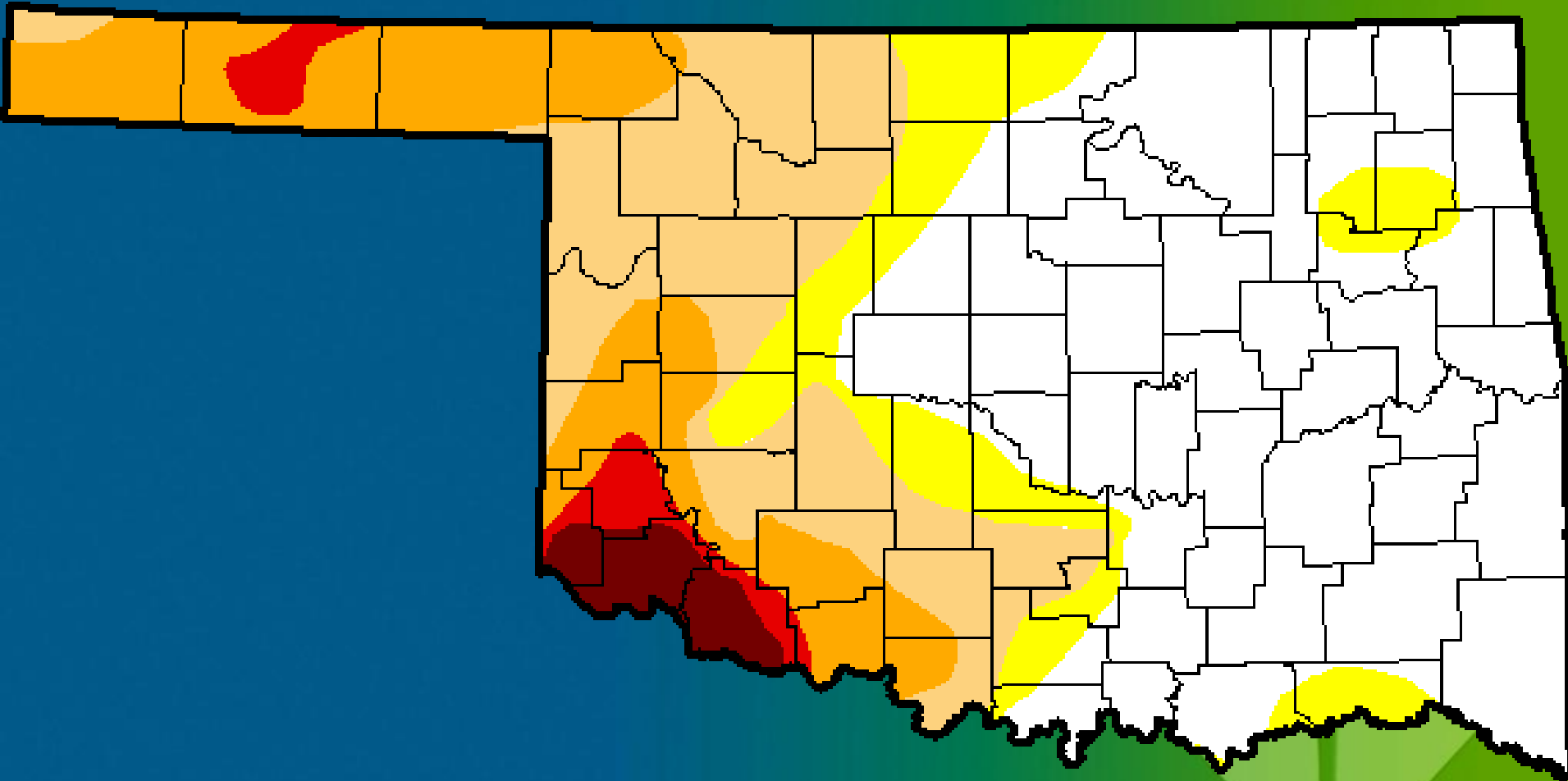
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October 2013



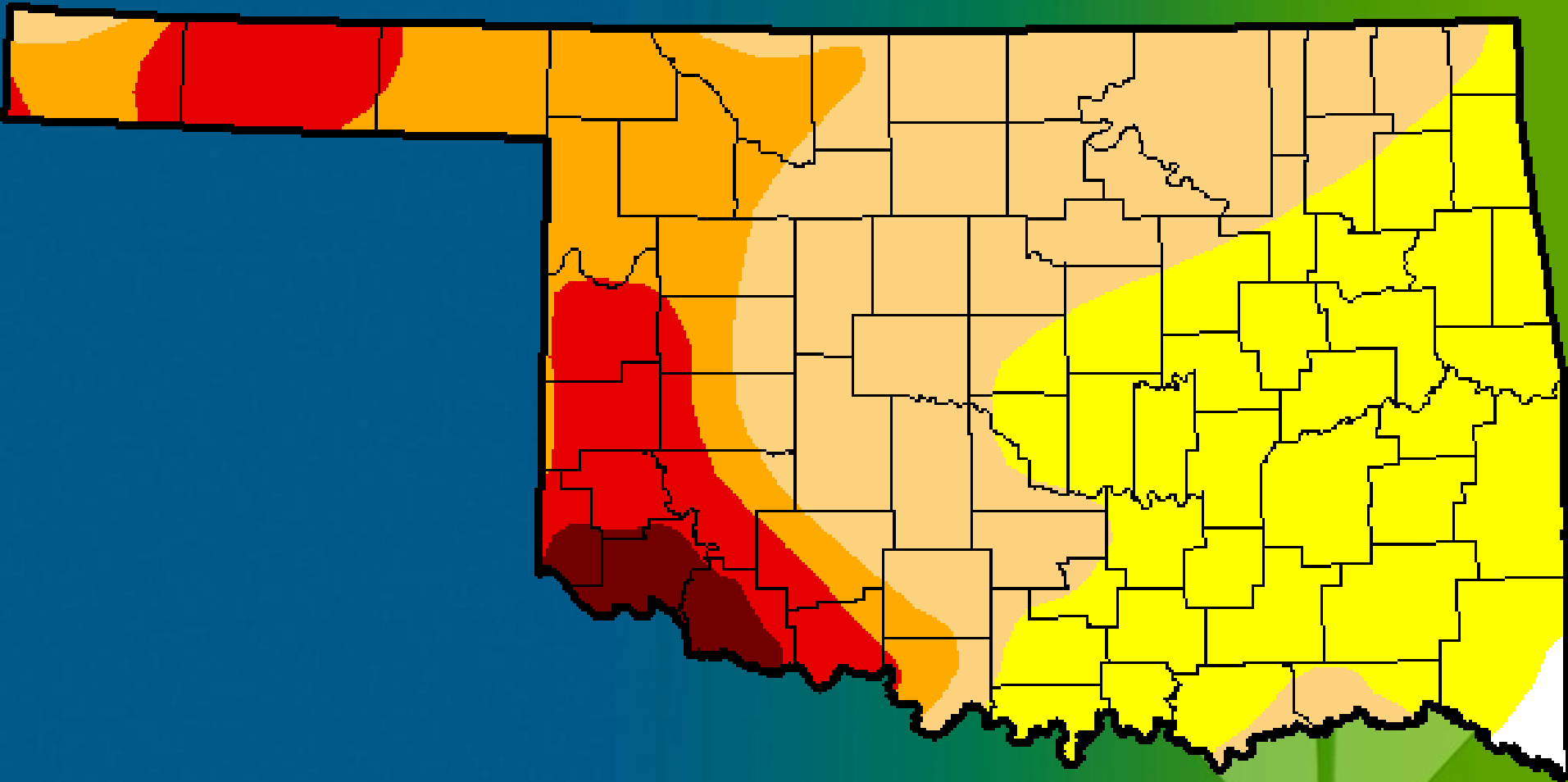
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January 2014



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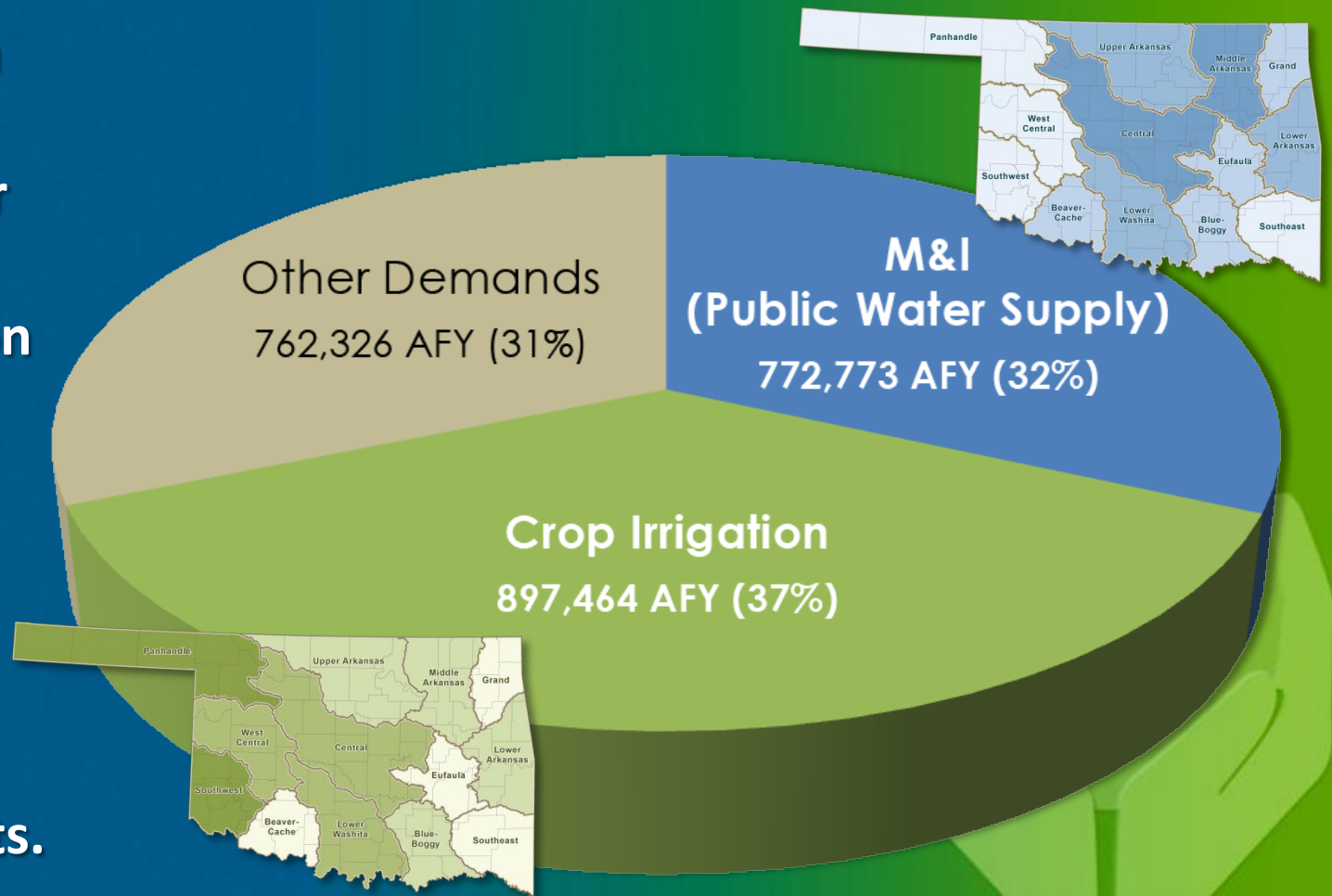
March 2014



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OCWP Water Conservation Analysis

Conservation in the M&I (Public Water Supply) and Crop Irrigation sectors has significant potential to reduce the severity and frequency of supply deficits.



OCWP Water Conservation Analysis

The OCWP analyzed two general levels of conservation for each of the two major demand sectors:

1. Moderately Expanded
2. Substantially Expanded

“What if” Scenarios - M&I:

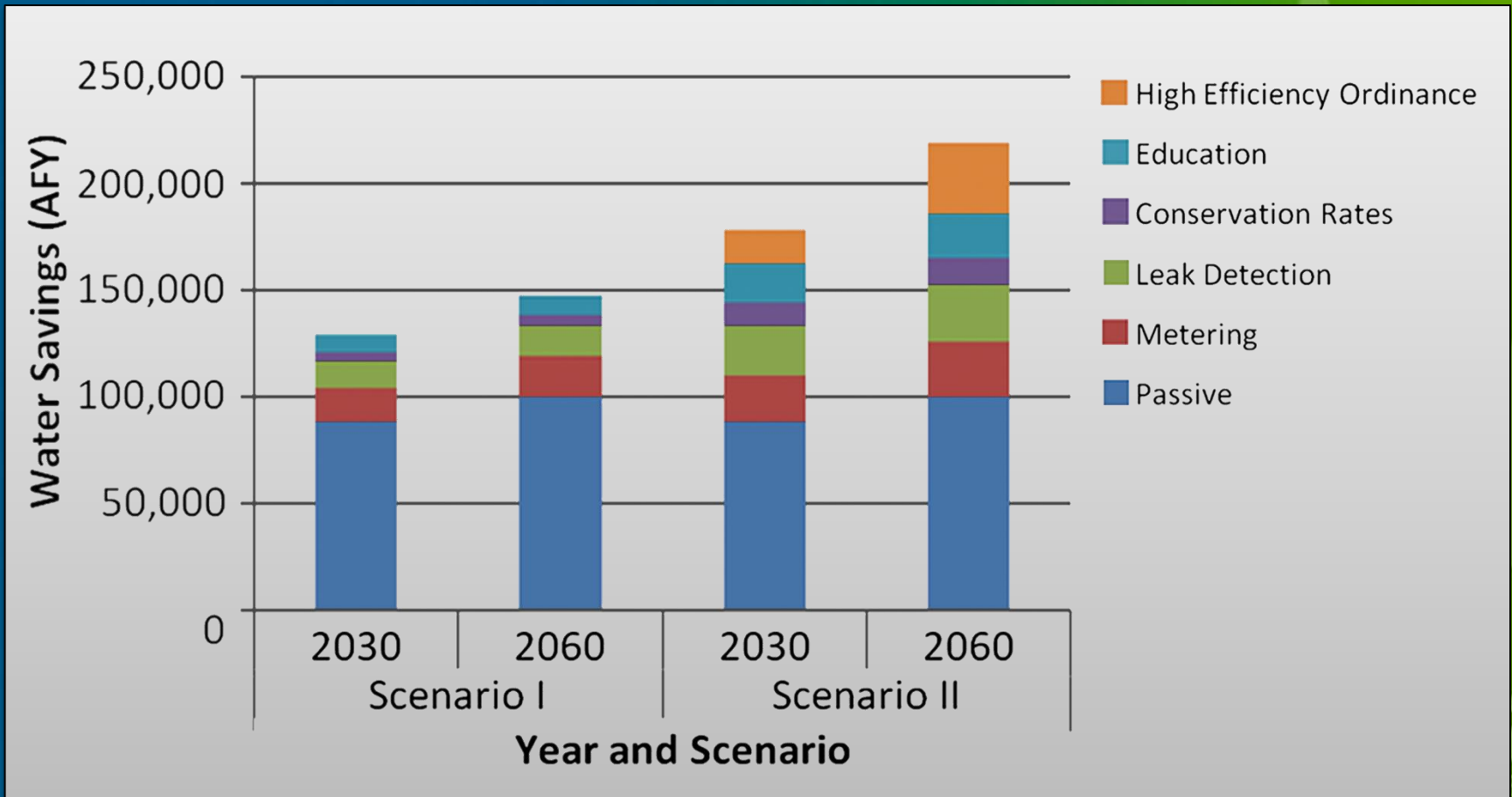
- Passive (Energy Policy Act) vs. high-efficiency plumbing codes/fixtures
- 90% vs. all systems metered
- Reduce system leakage and losses
- Conservation pricing levels
- Standard educational programs vs. school curriculum

“What if” Scenarios - Irrigation:

- Increase irrigation system efficiency
- Shift to less water-intensive crops

OCWP Water Conservation Analysis

Estimated Statewide M&I Water Savings by Program and Conservation Scenario



OCWP Water Conservation Analysis

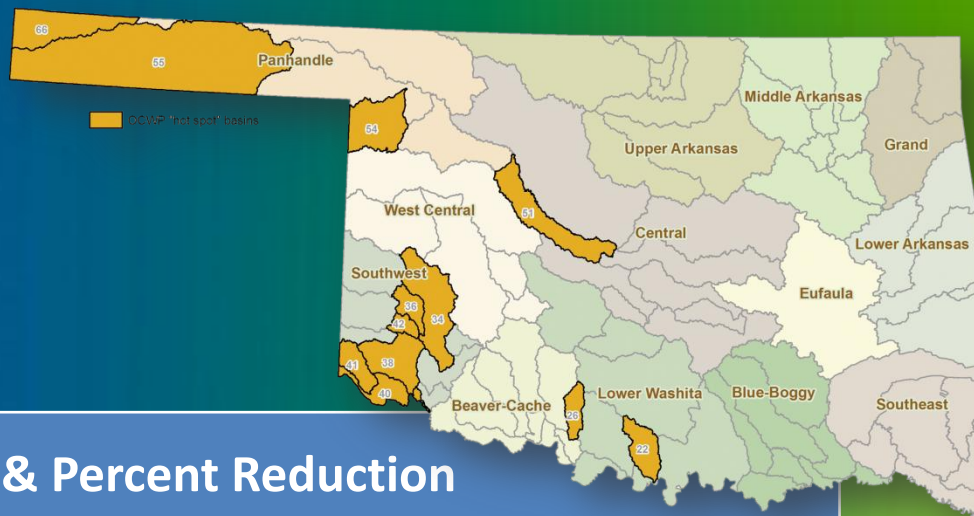
Potential Water Savings

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

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

OCWP Water Conservation Analysis

What is the Impact on Hot Spots?



Source	Baseline Shortage	Total & Percent Reduction from Baseline Shortage			
		Moderate Level		Substantial Level	
SW	14,590 AFY	7,440 AFY	51%	8,676 AFY	60%
AGW	12,070 AFY	6,036 AFY	50%	9,036 AFY	75%
BGW	69,000 AFY	24,080 AFY	35%	61,320 AFY	89%

Water for 2060

Promising Conservation Measures

Some Examples:

- Improved irrigation/farming techniques
- Water recycling/reuse systems
- High efficiency plumbing codes
- Smart irrigation
- Education programs that change consumer habits
- Water pricing
- Financial assistance incentives
- Leak detection and prevention



Marginal Quality Water Use

MQW SOURCES

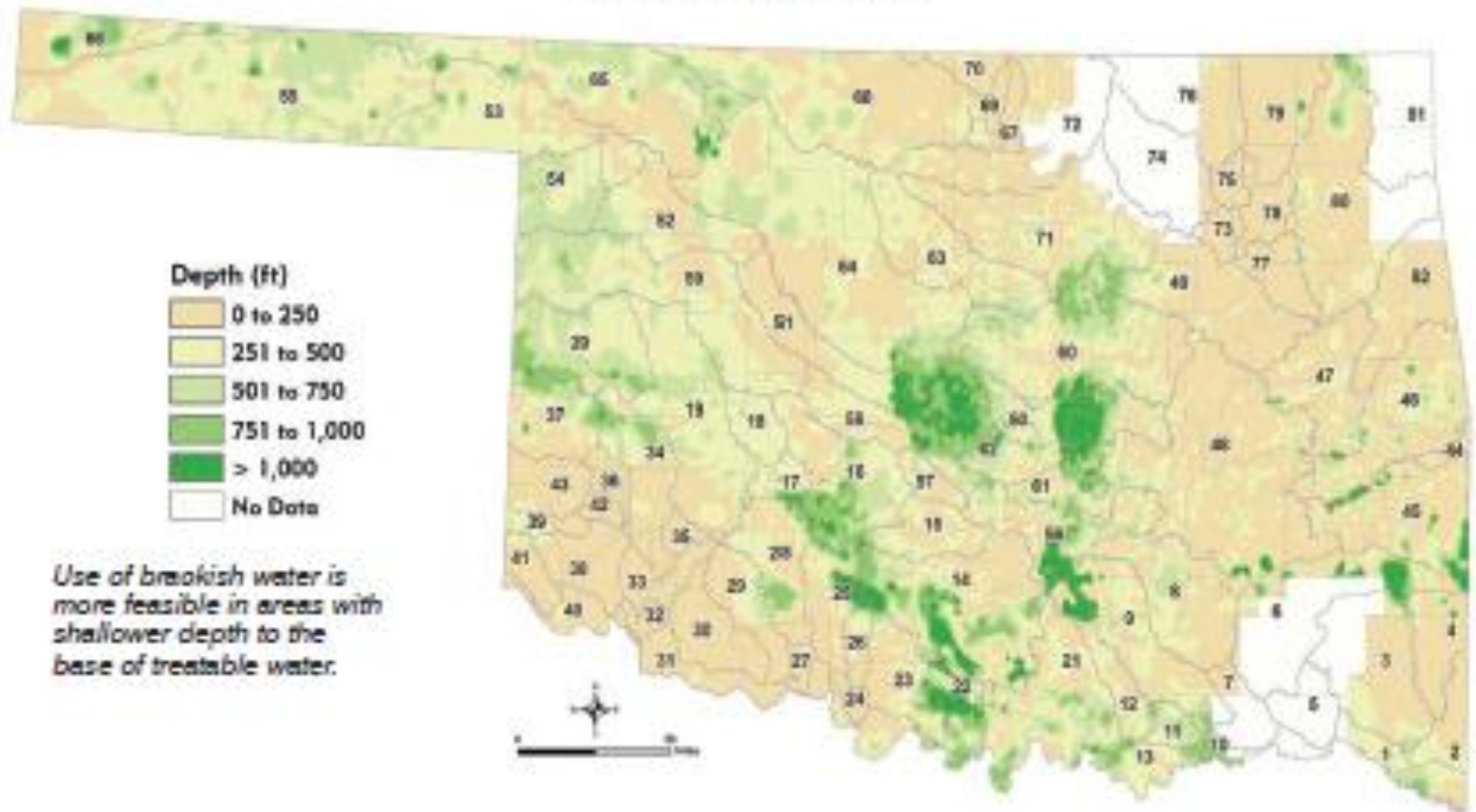
- Treated wastewater
- Stormwater runoff
- Oil & gas flowback/
produced water
- Brackish water
- Other lower-quality
sources

POTENTIAL MQW USES

- M&I – potable
- M&I – nonpotable
- Self-supplied residential
- Self-supplied industrial
- Thermoelectric power
- Oil & gas
- Crop irrigation
- Livestock watering

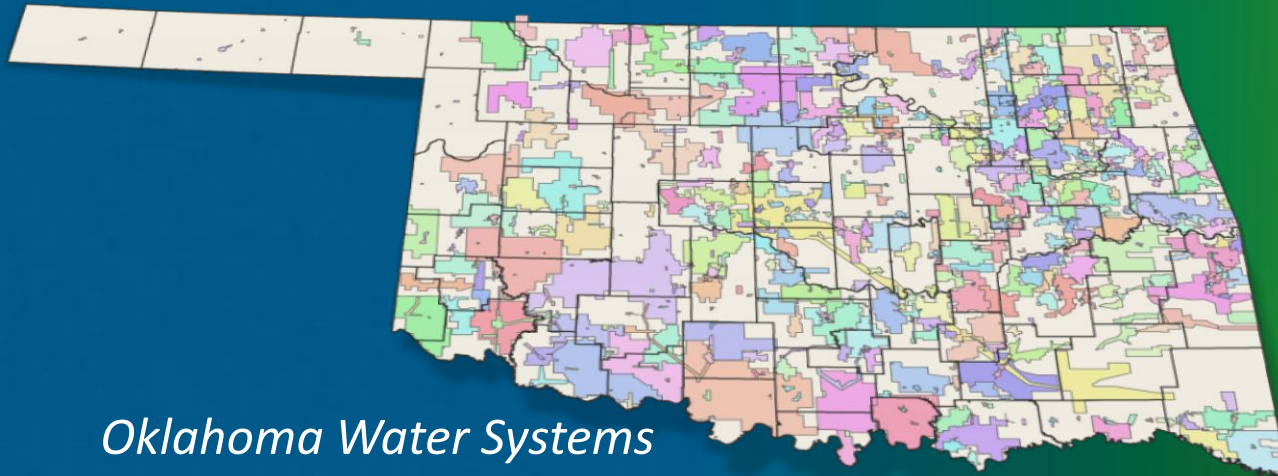
Example Marginal Quality Source: Brackish Water

Depth to **Base of Treatable Brackish Water**
10,000 mg/L TDS



Regionalization

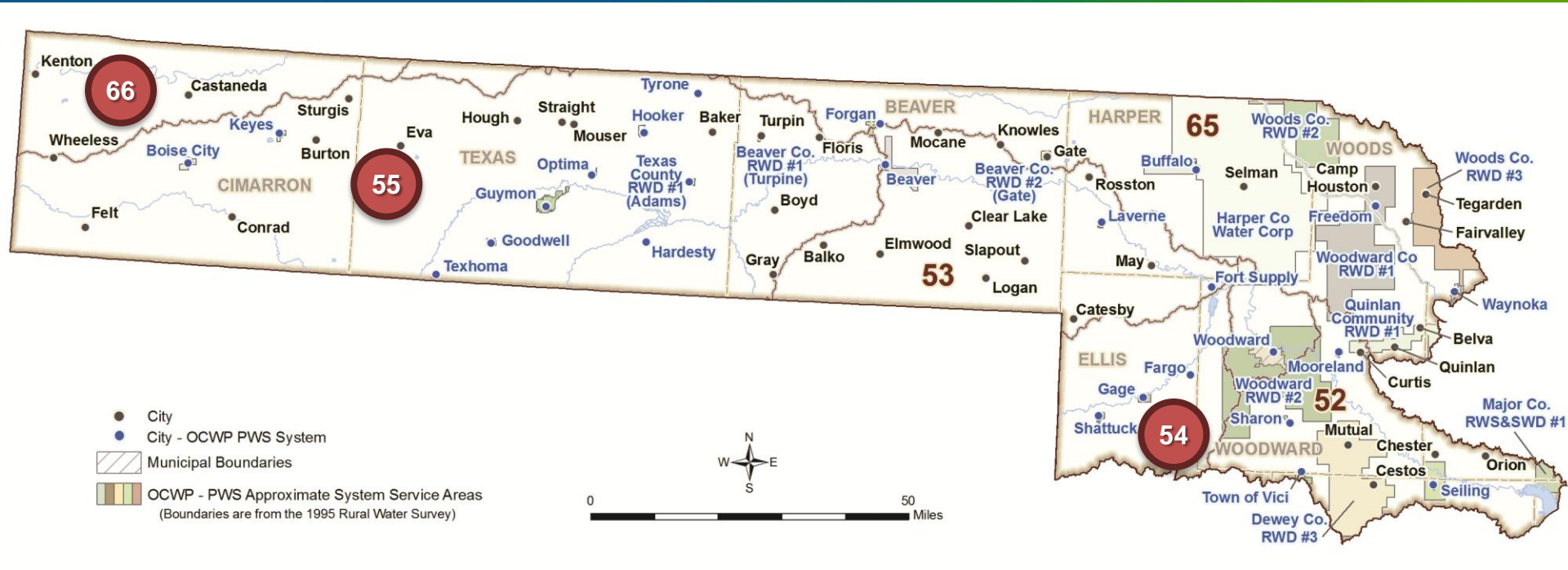
- Oklahoma has ~700 water systems serving less than 1,000 customers.
- Regionalization = interconnected systems sharing supplies
- Systems with multiple sources can be more resistant to drought and can share conservation programs



Oklahoma Water Systems

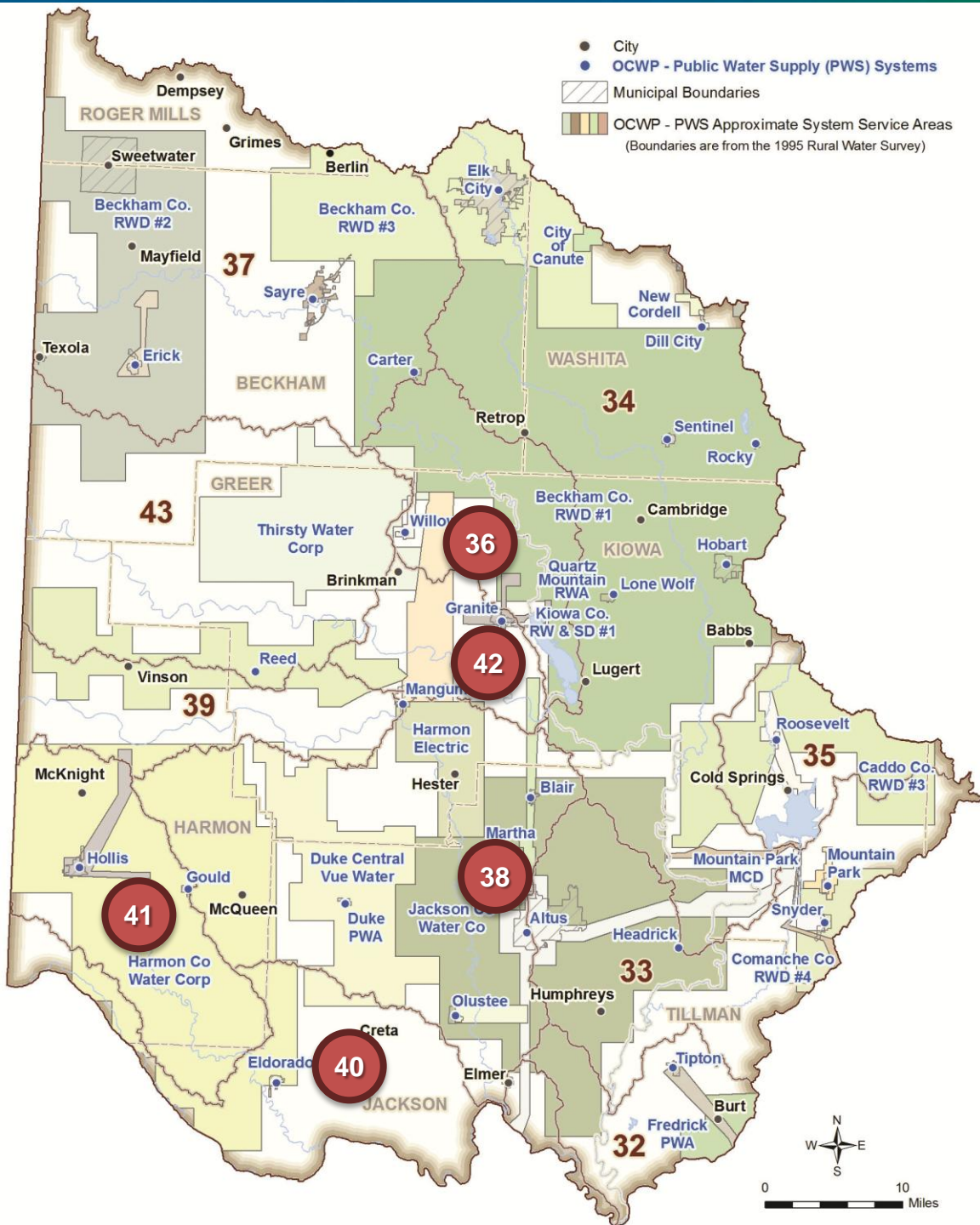
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Public Water Supply Regionalization Panhandle Region Municipal & Rural Water Systems



Hot Spot basin

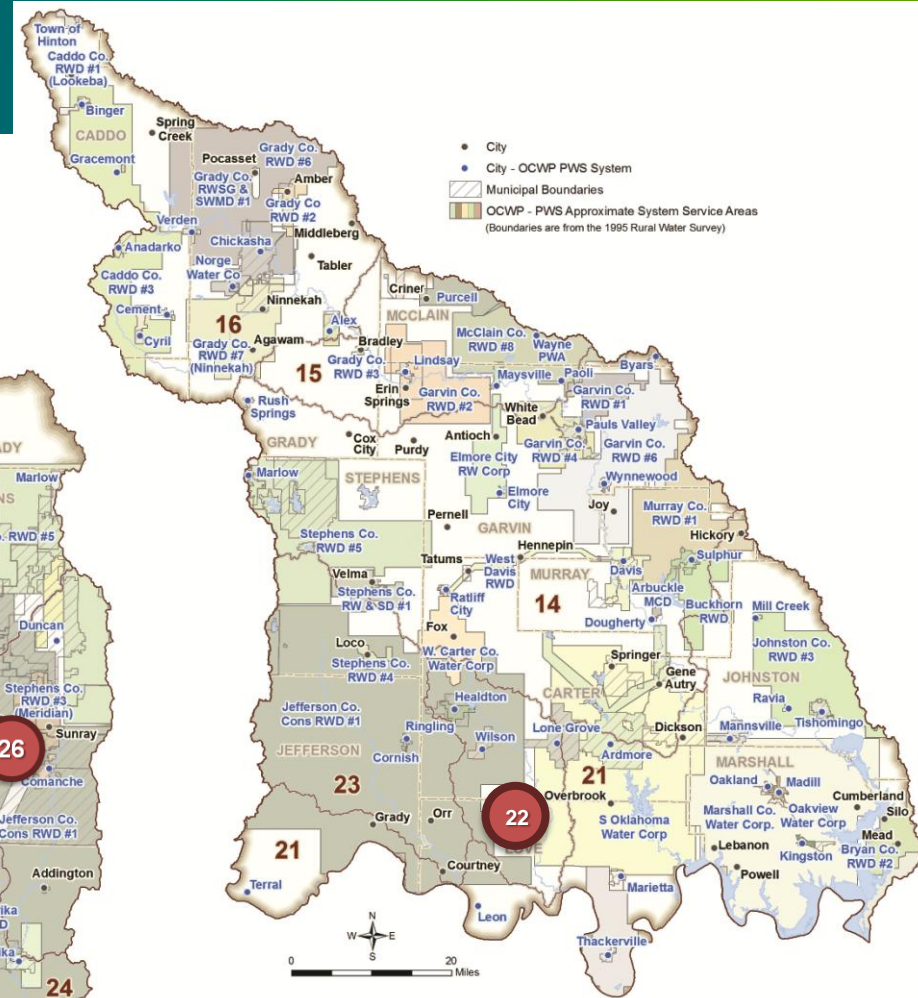
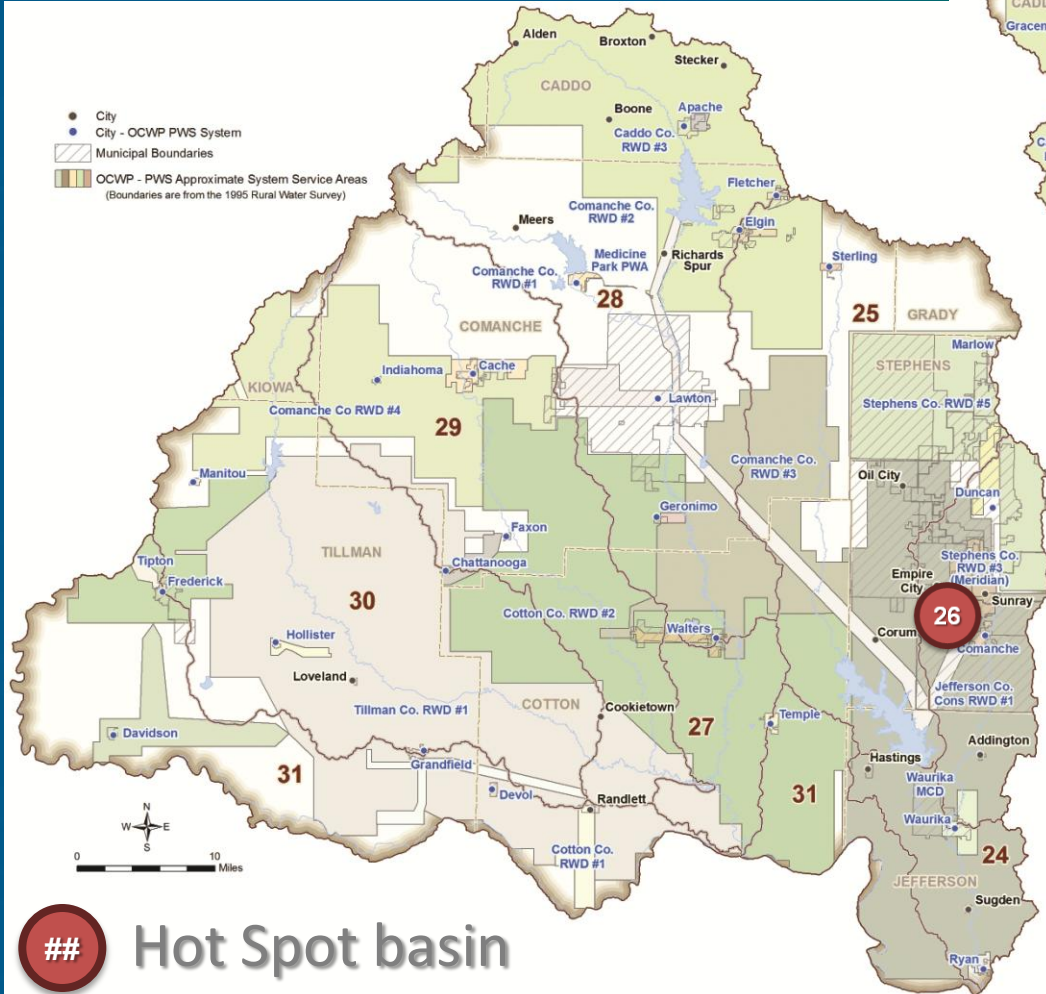
Public Water Supply Regionalization Southwest Region Municipal & Rural Water Systems



Hot Spot basin

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Public Water Supply Regionalization Beaver-Cache & Lower Washita Regions Municipal & Rural Water Systems



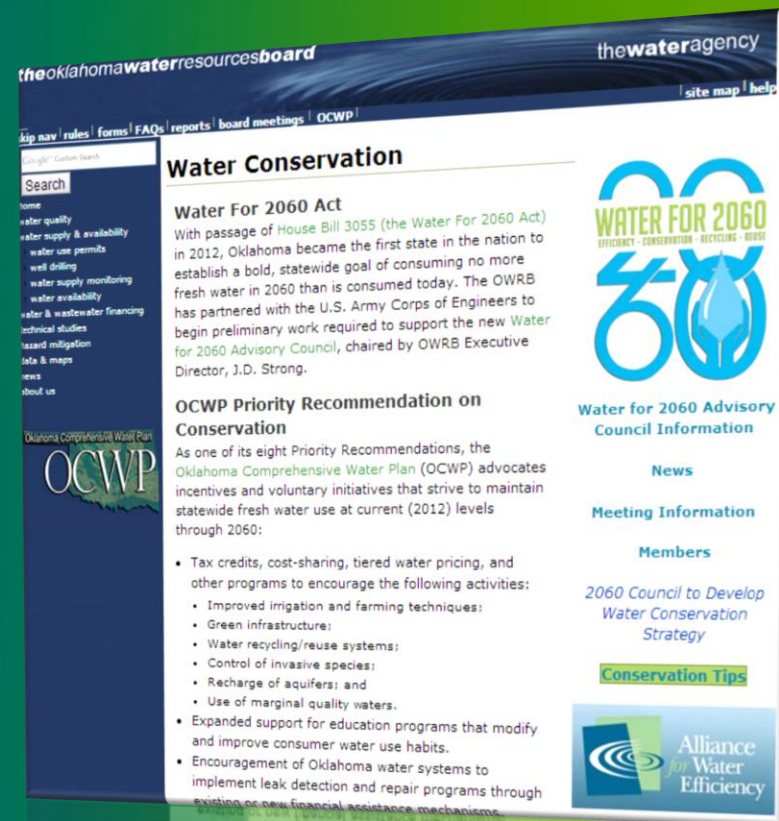
WATER FOR 2060
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Agenda

- Welcome
- Presentation
 - Hot Spot Basins
 - Overview of Hot Spot Basins in this Area
 - Current and upcoming Water for 2060 activities
 - How can water providers, agricultural producers, and water users monitor and participate?
- Discussion and Input

Your Involvement

- Monitor which Hot Spot basins are analyzed
- Generate efficiency ideas
- Share reports and data
- Check progress on Water for 2060 website (www.owrb.ok.gov/2060)
- Contact OWRB:
Terri Sparks 405-530-8800
terri.sparks@owrb.ok.gov
- Apply results in your area



The screenshot displays the website for the Oklahoma Water Resources Board (OWRB) under the heading "Water Conservation". The page features a navigation menu at the top with links for "kip nav", "rules", "forms", "FAQs", "reports", "board meetings", and "OCWP". A search bar is located on the left side. The main content area is titled "Water Conservation" and includes a section for the "Water For 2060 Act", which states that in 2012, Oklahoma became the first state to establish a goal of consuming no more fresh water in 2060 than is consumed today. It also mentions a partnership with the U.S. Army Corps of Engineers for preliminary work on the new Water for 2060 Advisory Council. Below this is a section for "OCWP Priority Recommendation on Conservation", which lists eight priority recommendations, including tax credits, improved irrigation, green infrastructure, water recycling, and expanded support for education programs. The page also features a "Conservation Tips" section and a logo for the "Alliance for Water Efficiency".

theoklahomawaterresourcesboard thewateragency

kip nav | rules | forms | FAQs | reports | board meetings | OCWP | site map | help

Search

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Oklahoma Comprehensive Water Plan
OCWP

Water Conservation

Water For 2060 Act

With passage of House Bill 3055 (the Water For 2060 Act) in 2012, Oklahoma became the first state in the nation to establish a bold, statewide goal of consuming no more fresh water in 2060 than is consumed today. The OWRB has partnered with the U.S. Army Corps of Engineers to begin preliminary work required to support the new Water for 2060 Advisory Council, chaired by OWRB Executive Director, J.D. Strong.

OCWP Priority Recommendation on Conservation

As one of its eight Priority Recommendations, the Oklahoma Comprehensive Water Plan (OCWP) advocates incentives and voluntary initiatives that strive to maintain statewide fresh water use at current (2012) levels through 2060:

- Tax credits, cost-sharing, tiered water pricing, and other programs to encourage the following activities:
 - Improved irrigation and farming techniques;
 - Green infrastructure;
 - Water recycling/reuse systems;
 - Control of invasive species;
 - Recharge of aquifers; and
 - Use of marginal quality waters.
- Expanded support for education programs that modify and improve consumer water use habits.
- Encouragement of Oklahoma water systems to implement leak detection and repair programs through expansion of new financial assistance mechanisms.

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Water for 2060 Advisory Council Information

News

Meeting Information

Members

2060 Council to Develop Water Conservation Strategy

Conservation Tips

Alliance for Water Efficiency

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Discussion and Input

- What opportunities are there for additional conservation, reuse, and water efficiency in our area?
- What marginal quality supplies are available, and how might we use them? Why aren't we already using them?
- Are there examples of regionalized public water supply systems? What has and hasn't worked? Are there other regionalization options we should look at?
- Additional questions and ideas



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