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

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

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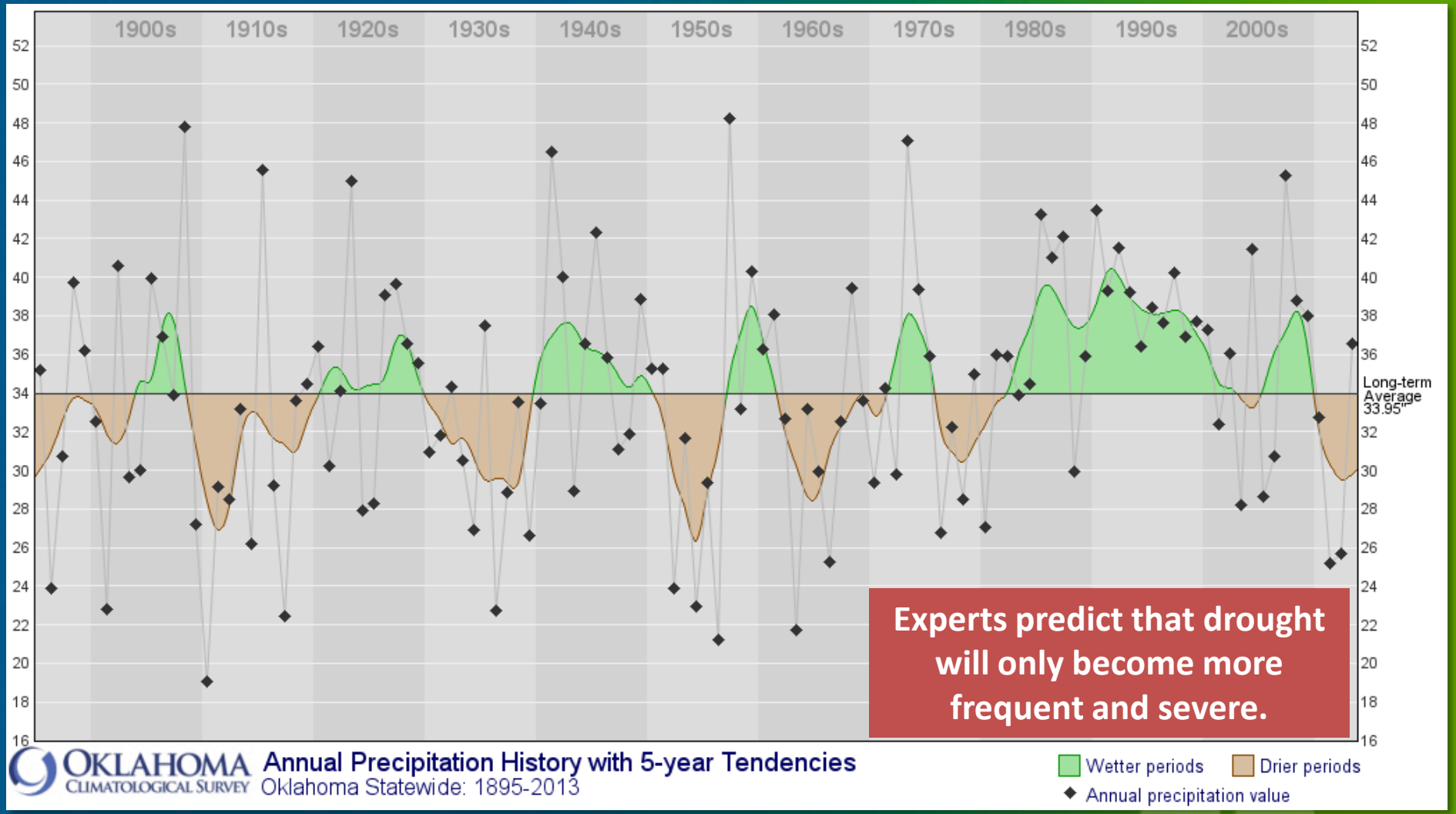
Oklahoma's Precipitation History (1895-2013)



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Key Findings from the Oklahoma Comprehensive Water Plan

OCWP

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.

OCWP
Oklahoma Comprehensive Water Plan

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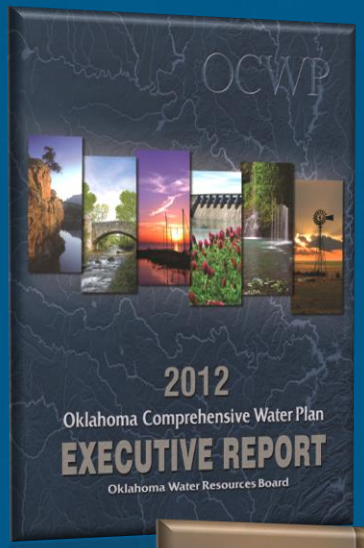
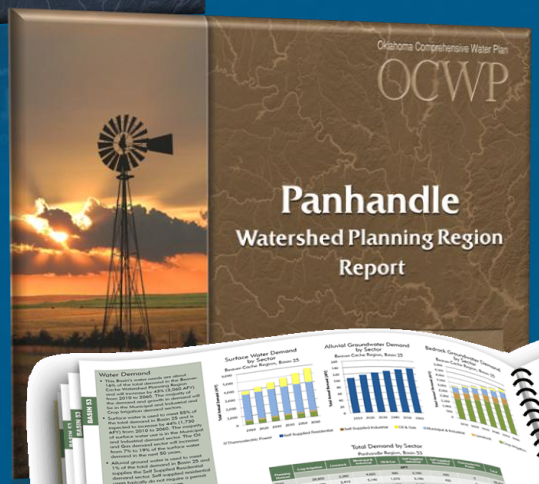
Most Comprehensive Plan Ever



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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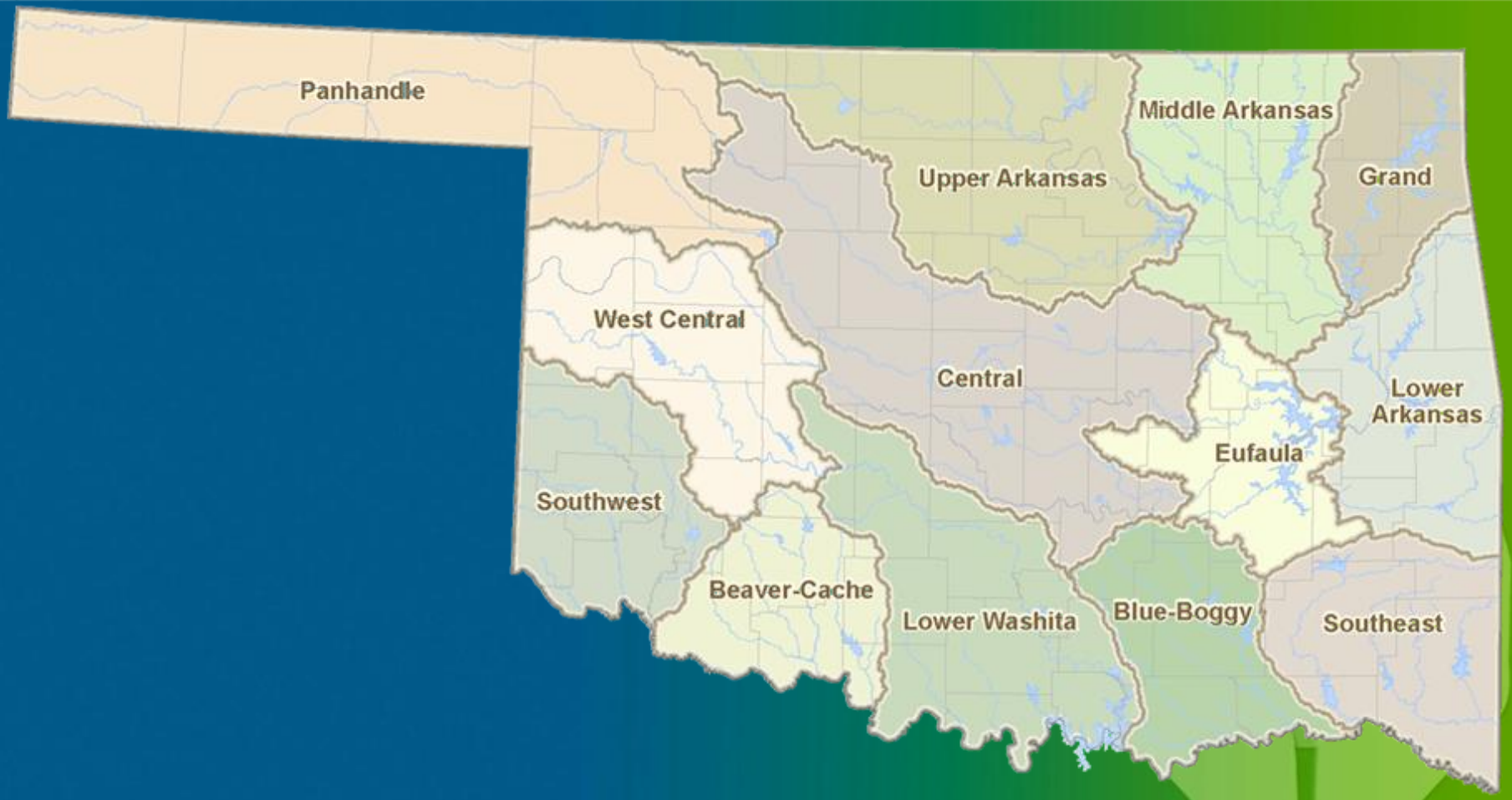
13 Watershed Planning Regions



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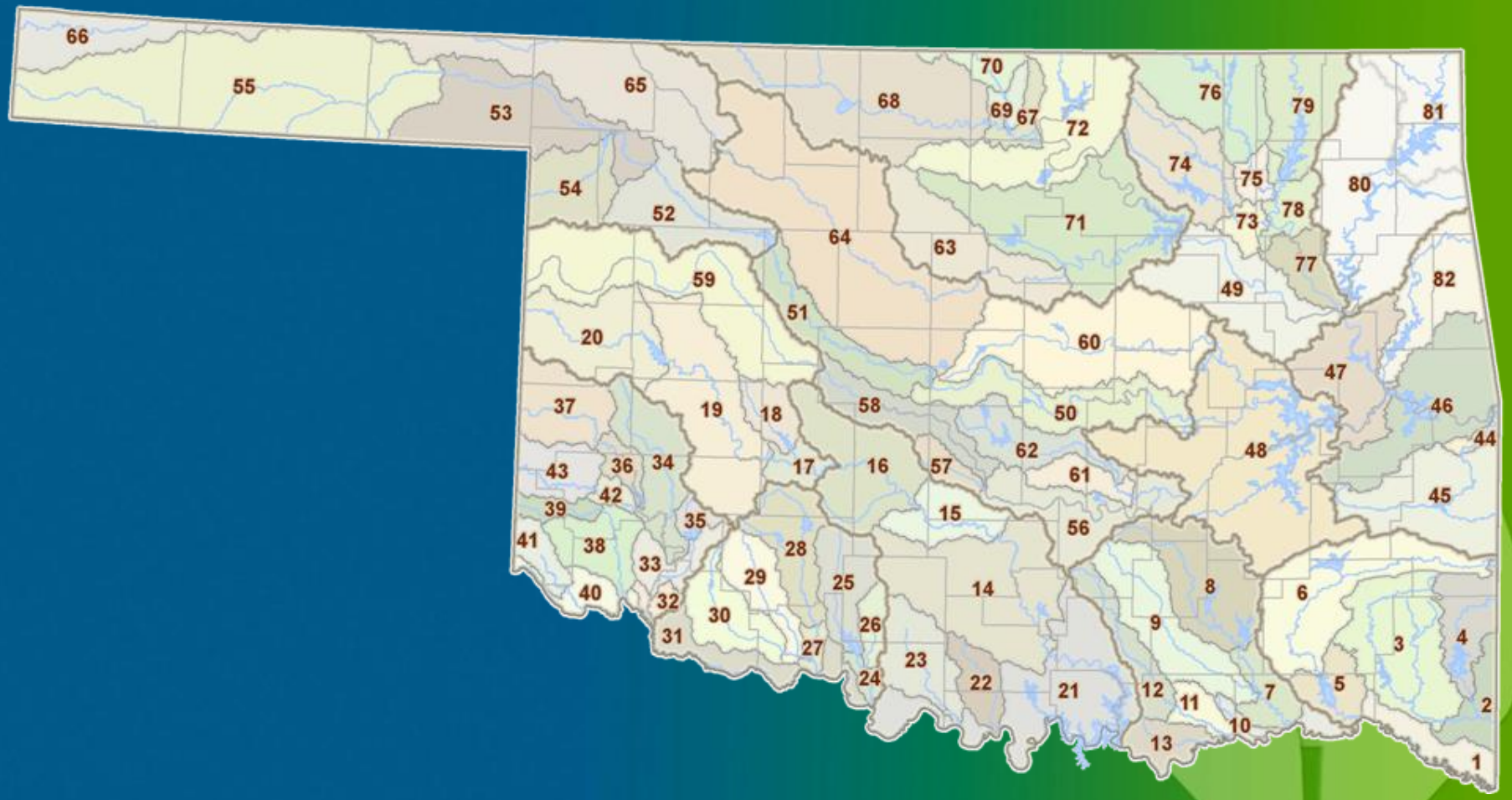
82 Basins for Detailed Analysis



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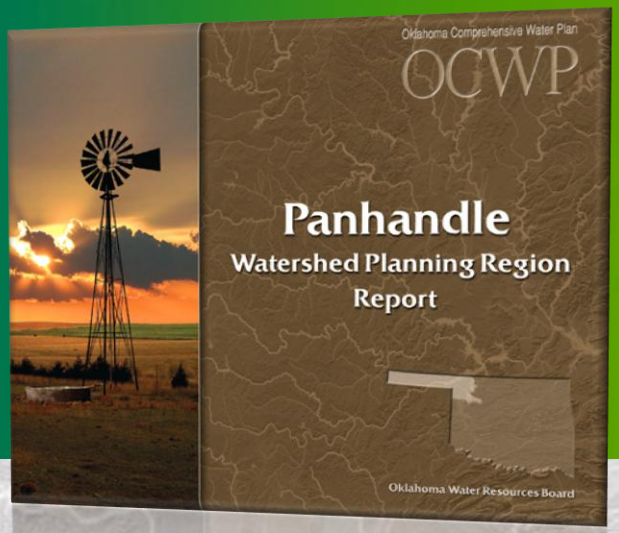
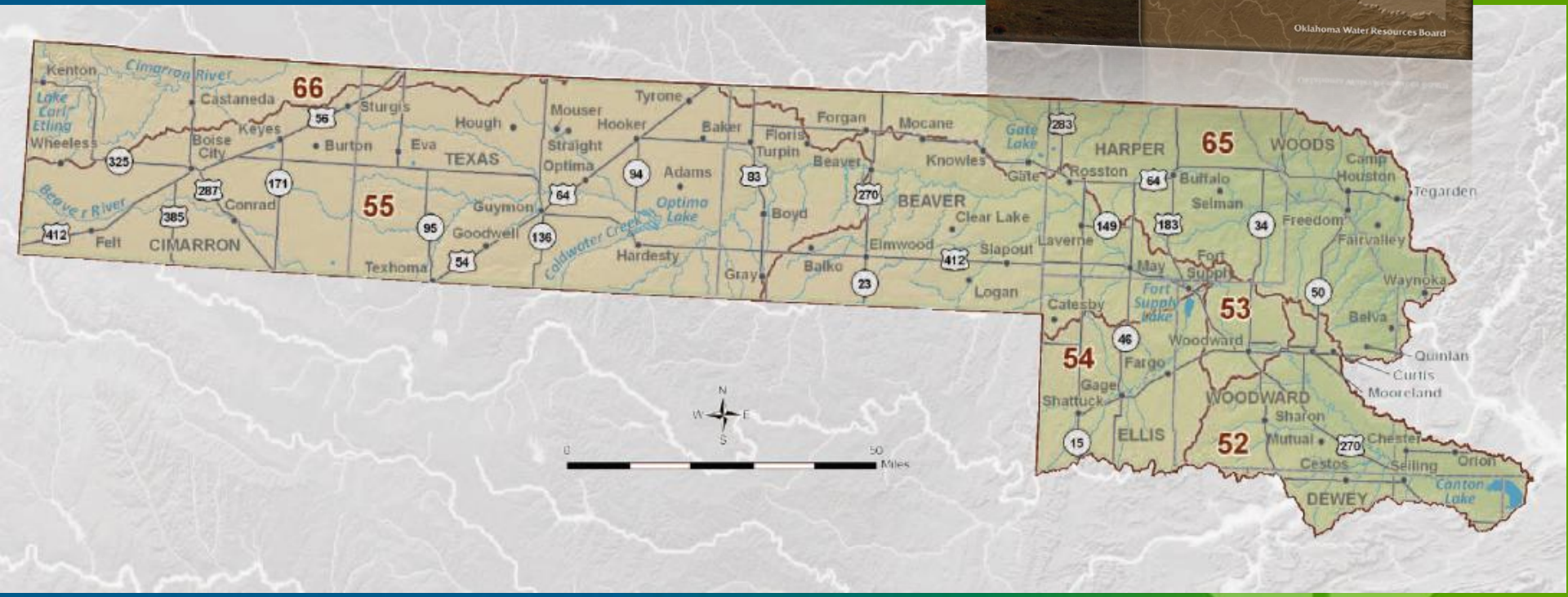
Panhandle Region





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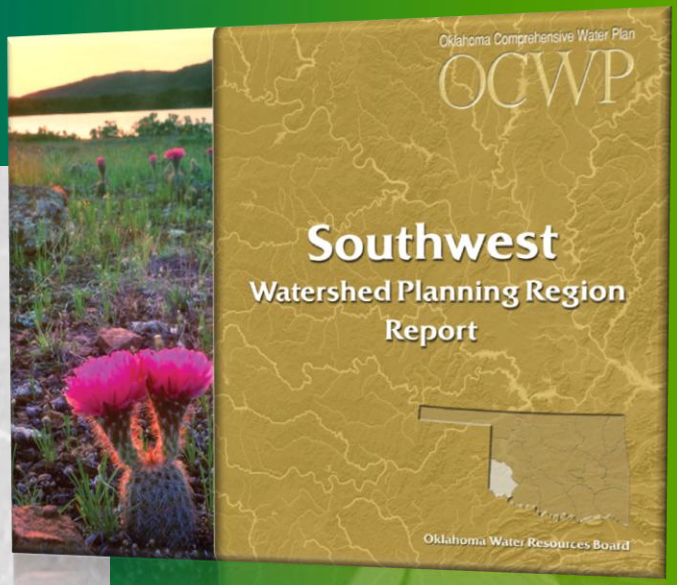
Southwest Region



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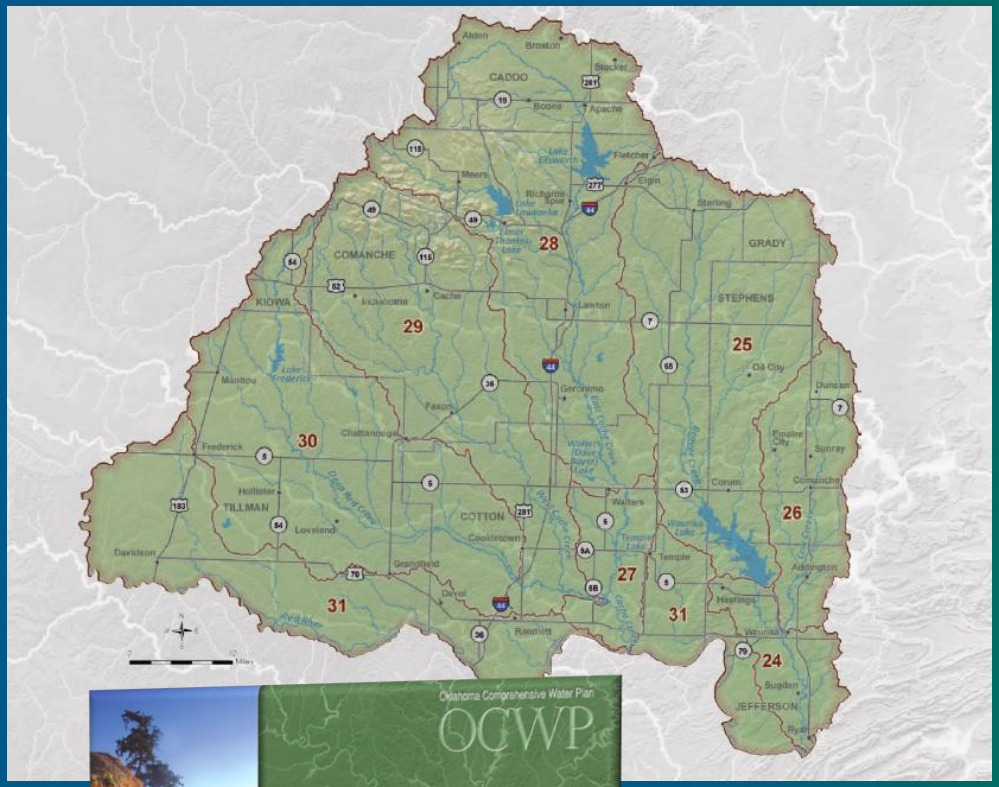
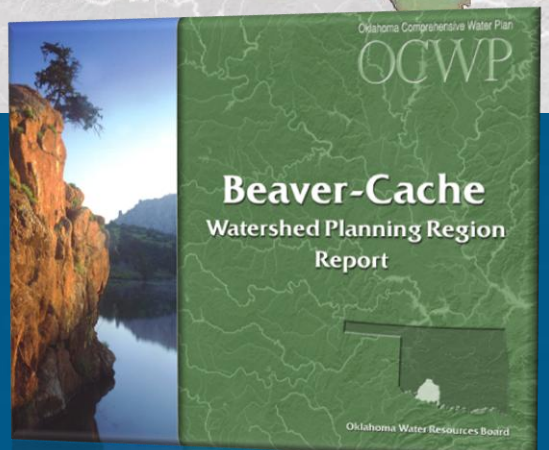
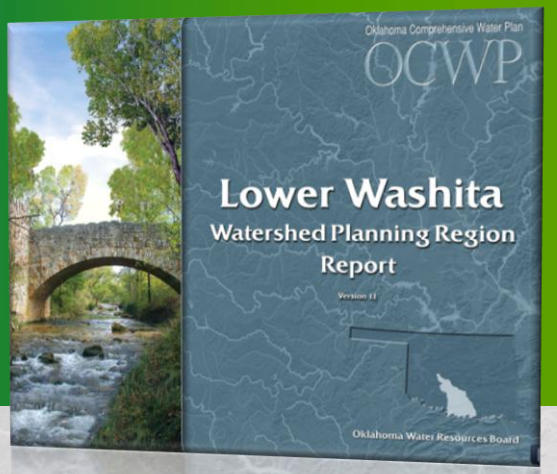
Beaver-Cache and Lower Washita Regions







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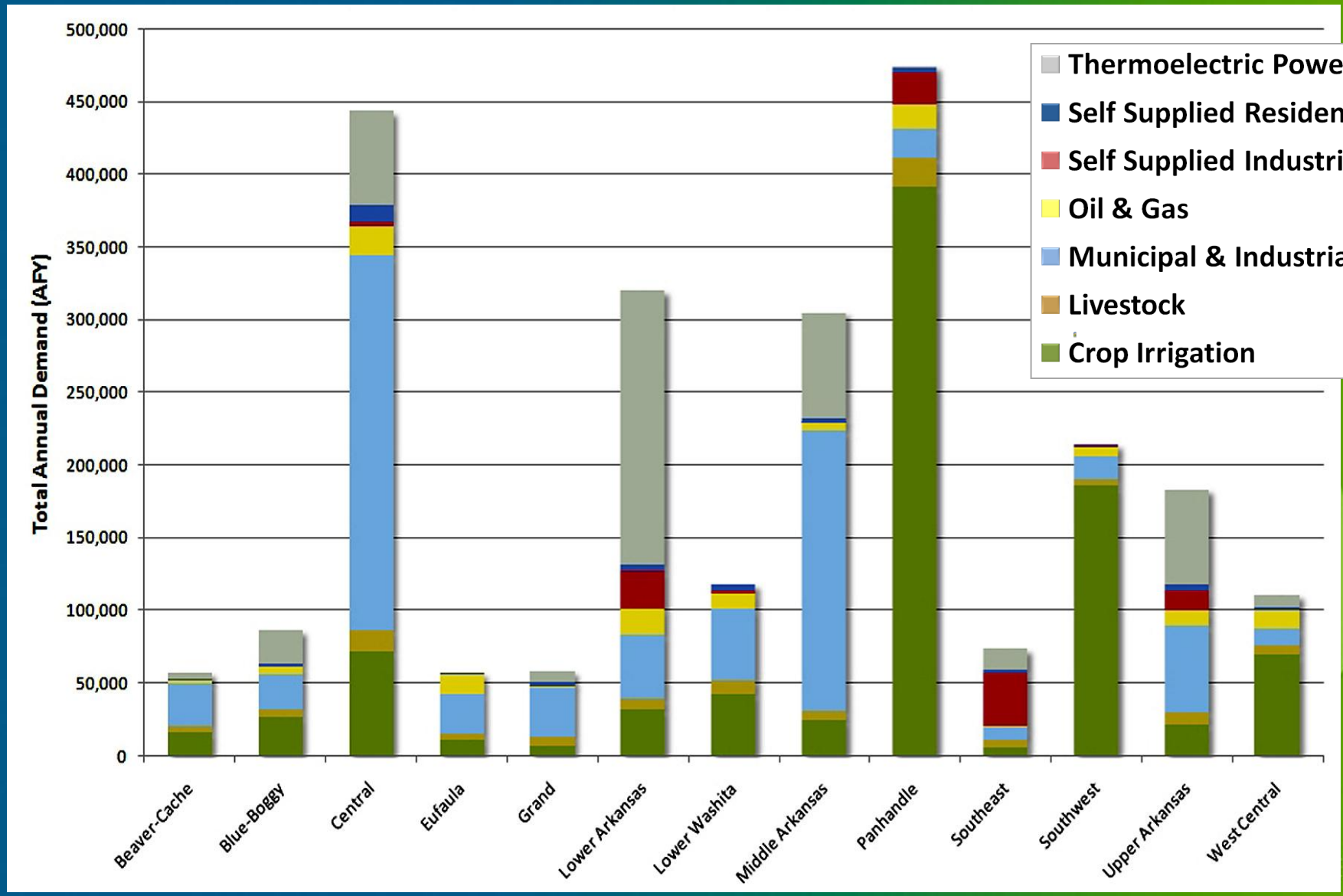
2060 Water Demands By Region



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**

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“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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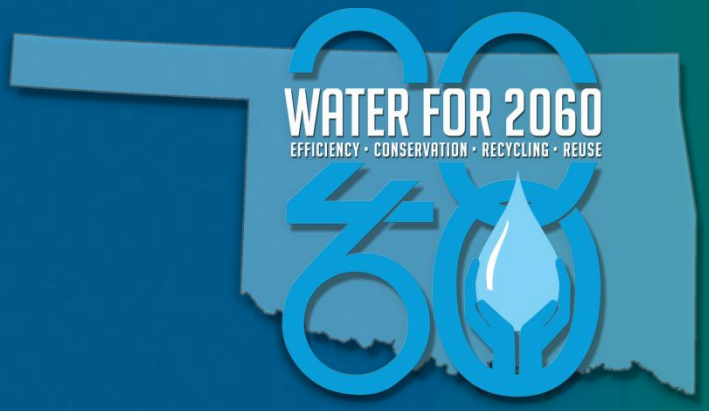
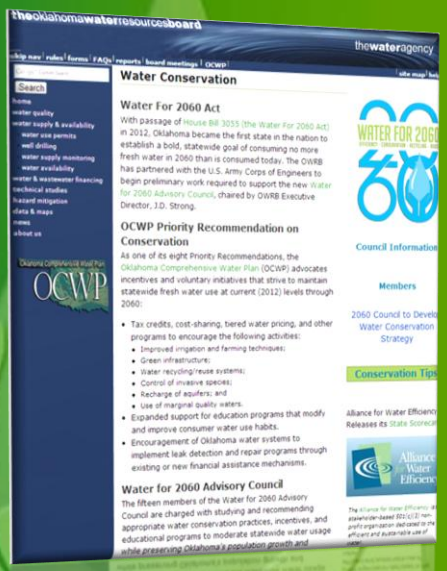
What is Water for 2060?



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**

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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

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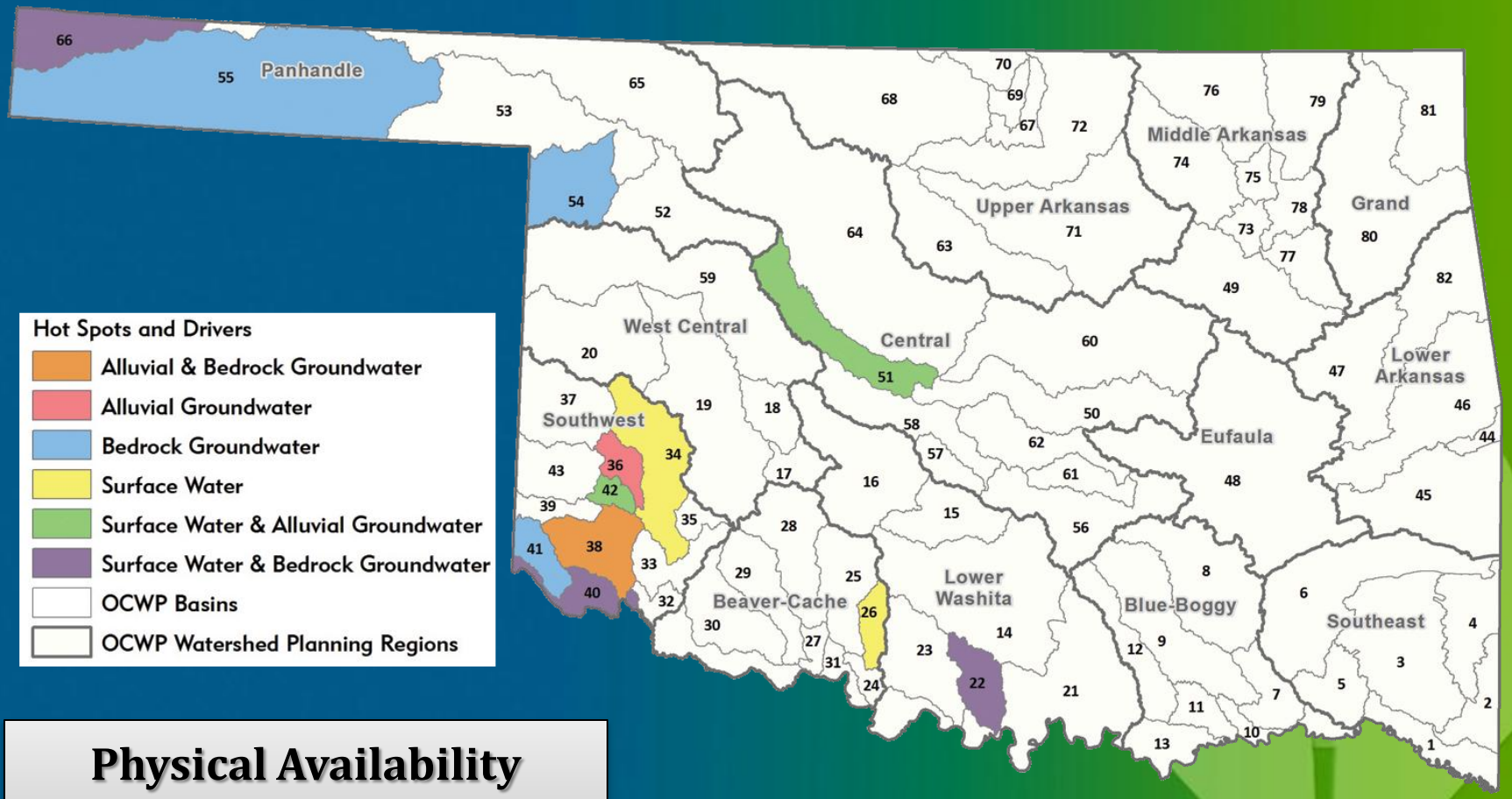
Hot Spot Basins

12 basins with most significant supply challenges



Physical Availability
Permit Availability
Water Quality

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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
	Shortages will occur most years		
2060 Bedrock Groundwater Depletions (AFY)	9,260	47,090	5,230

Pumping costs will increase over time

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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
2060 Bedrock Groundwater Depletions (AFY)	0	0	2,260	870	2,420	440

Shortages will occur most years

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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 *Shortages will occur most years*	110
2060 Bedrock Groundwater Depletions (AFY)	920	290

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Feasibility of Supplies and Water Management Strategies

- Analysis of Fundamental Options:
  - Demand Management
  - Out-of-Basin Supplies
  - Reservoir Use
  - Increasing Reliance on SW or GW
- Conservation Analysis
- Aquifer Recharge Study and Workgroup
- Marginal Quality Water Study and Workgroup
- Reservoir Viability Study

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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).

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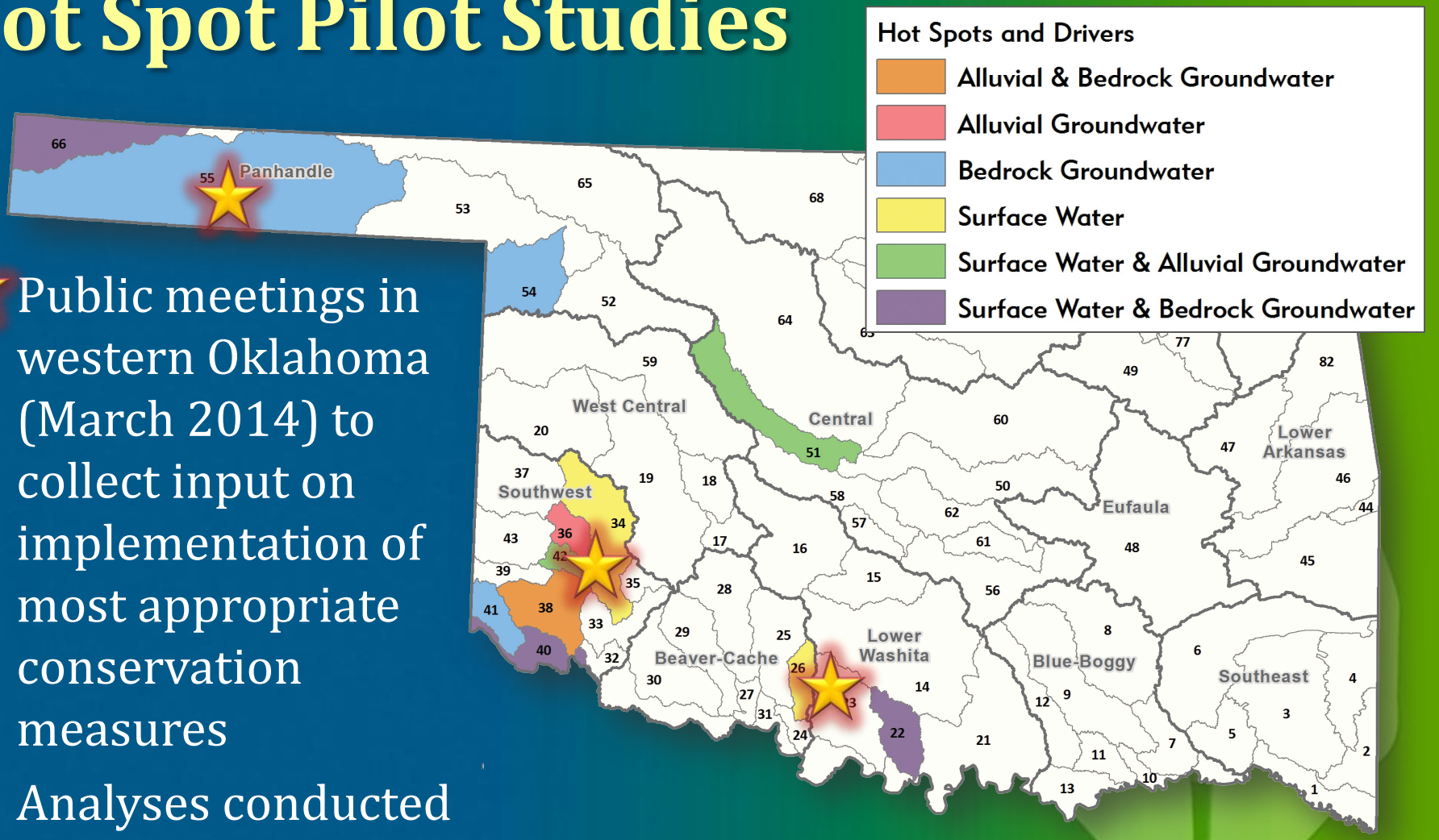
Water for 2060
Hot Spot Pilot Studies



- Public meetings in western Oklahoma (March 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

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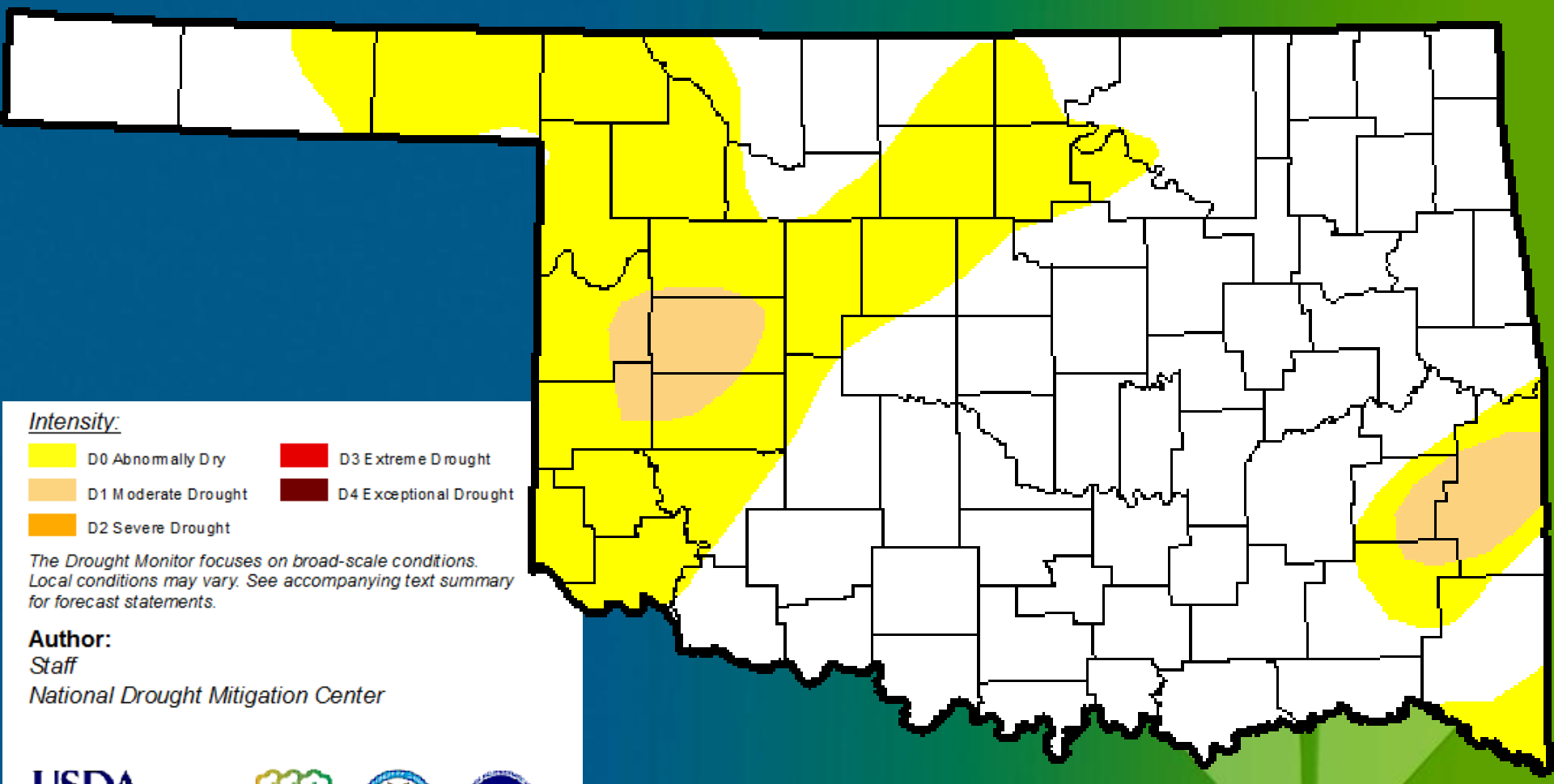
October 2010
Onset of the Oklahoma Drought



Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

USDA

National Drought Mitigation Center

http://droughtmonitor.unl.edu/

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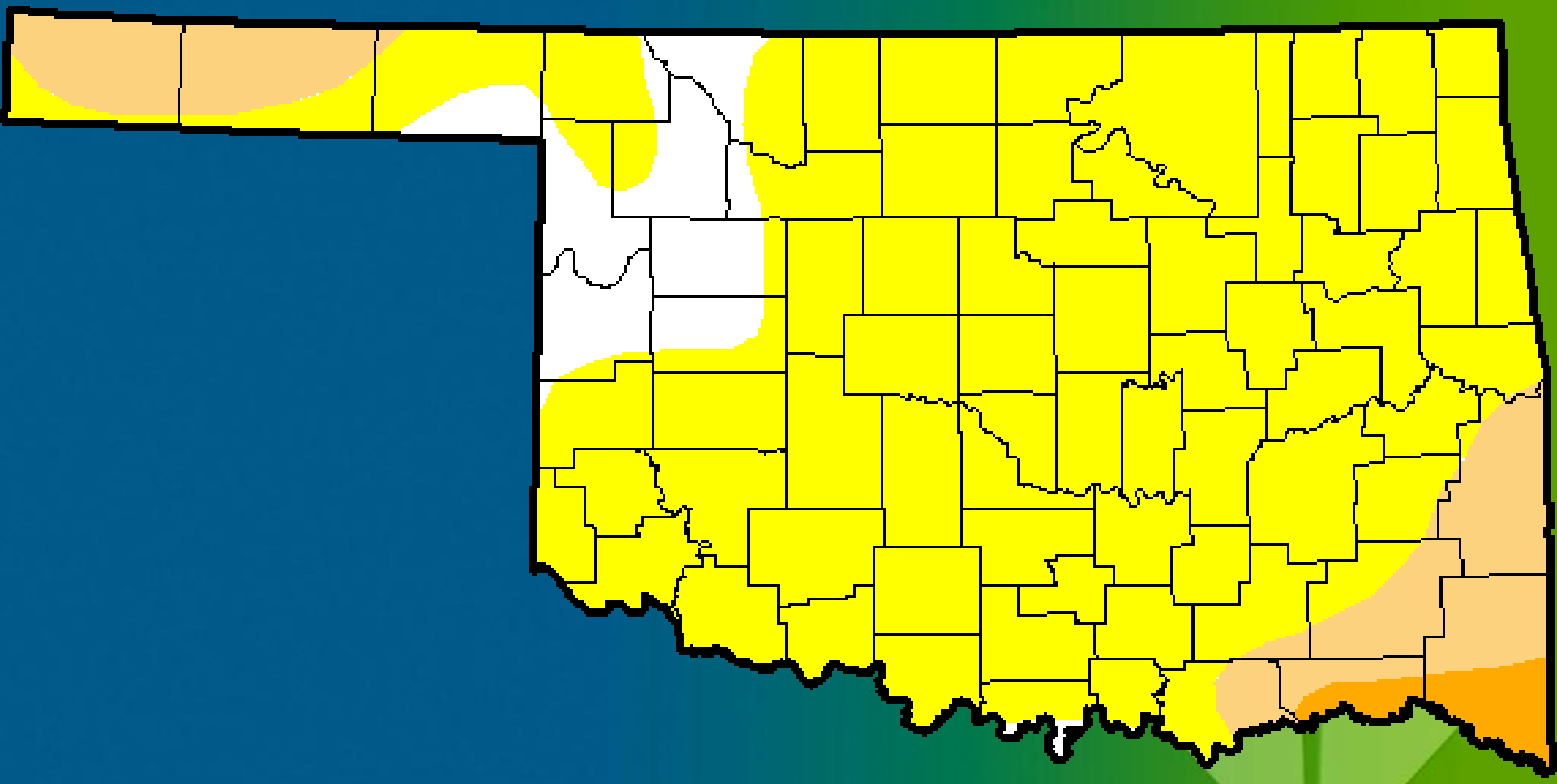
January 2011



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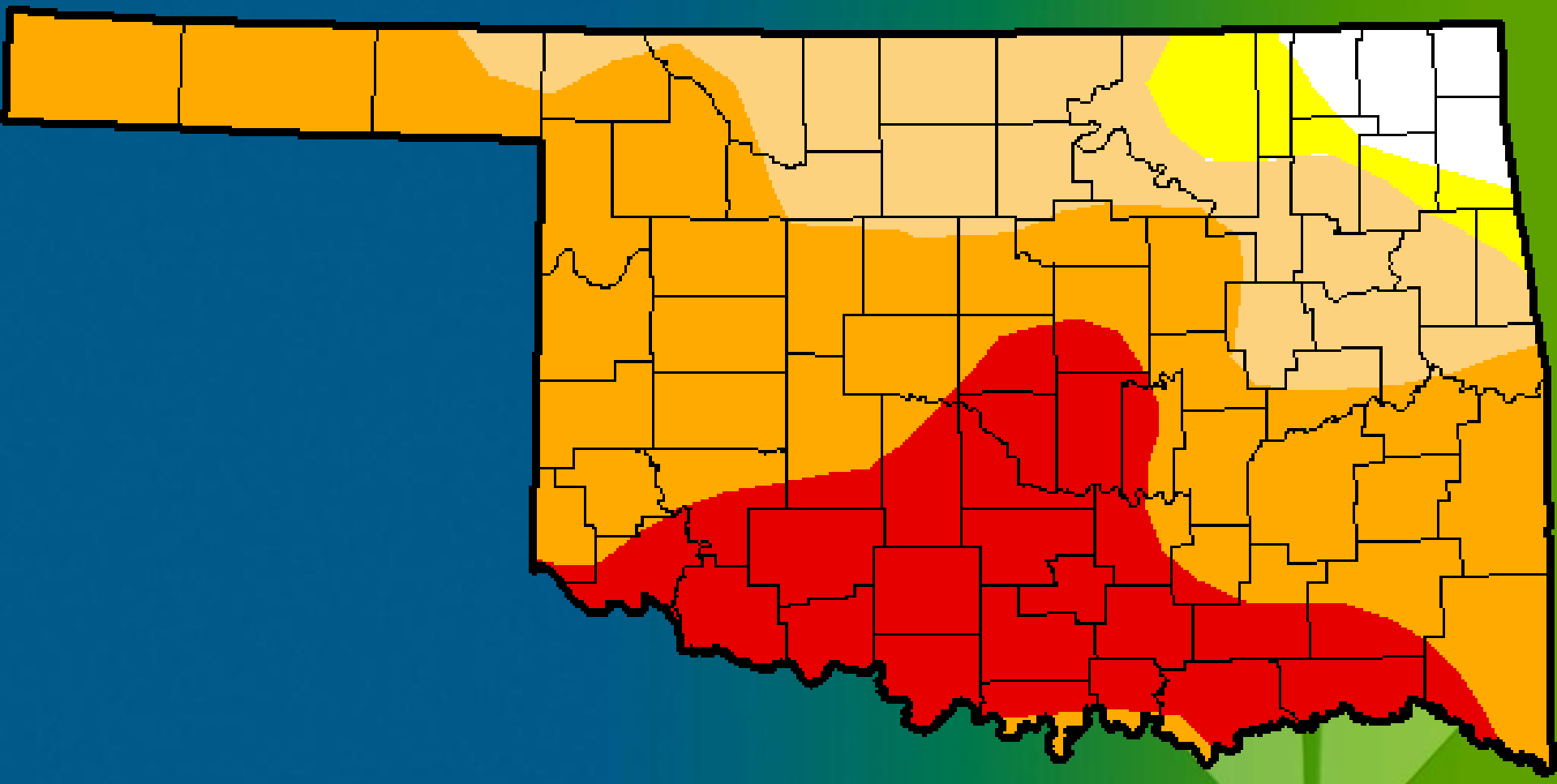
April 2011



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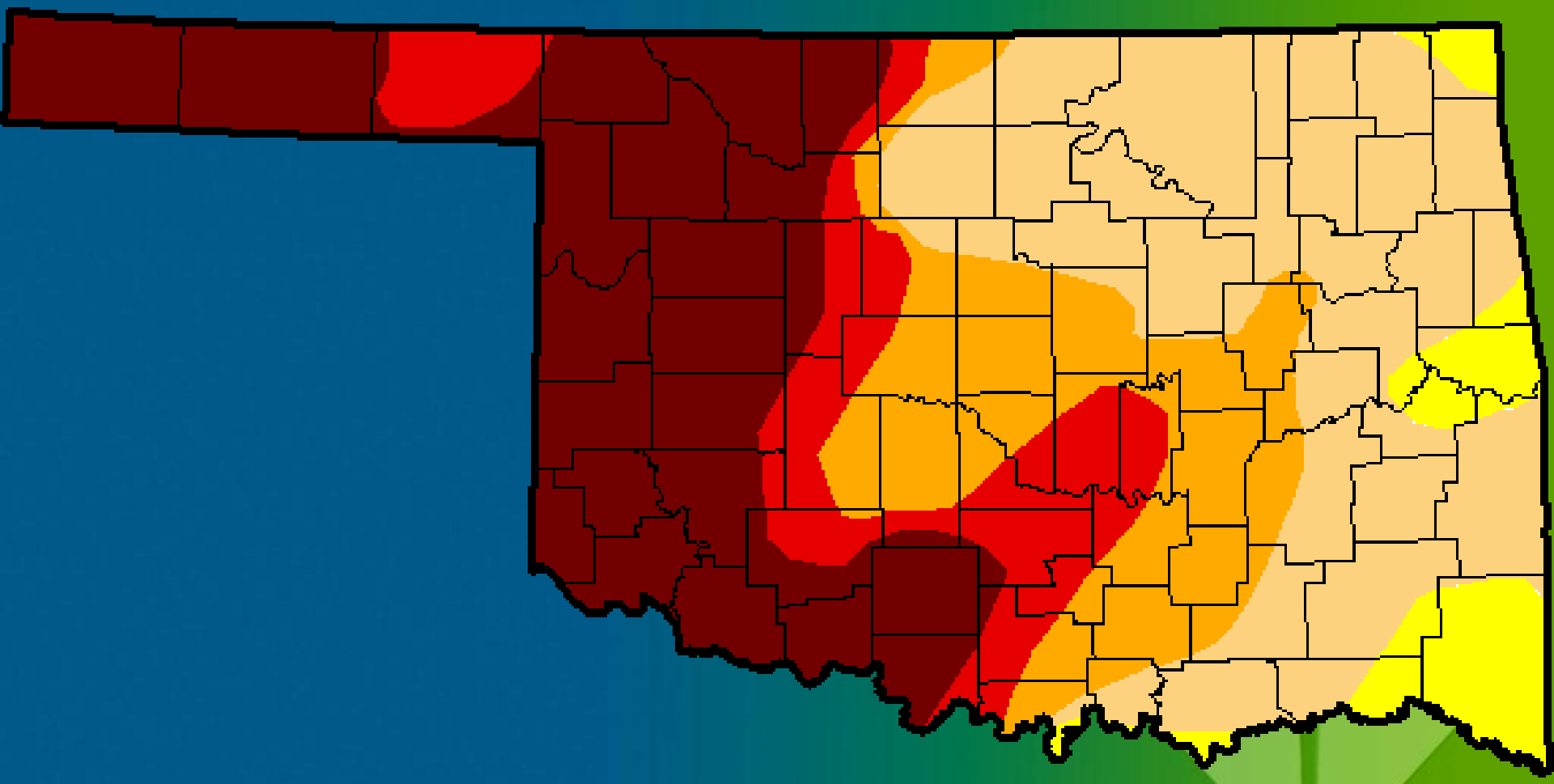
July 2011



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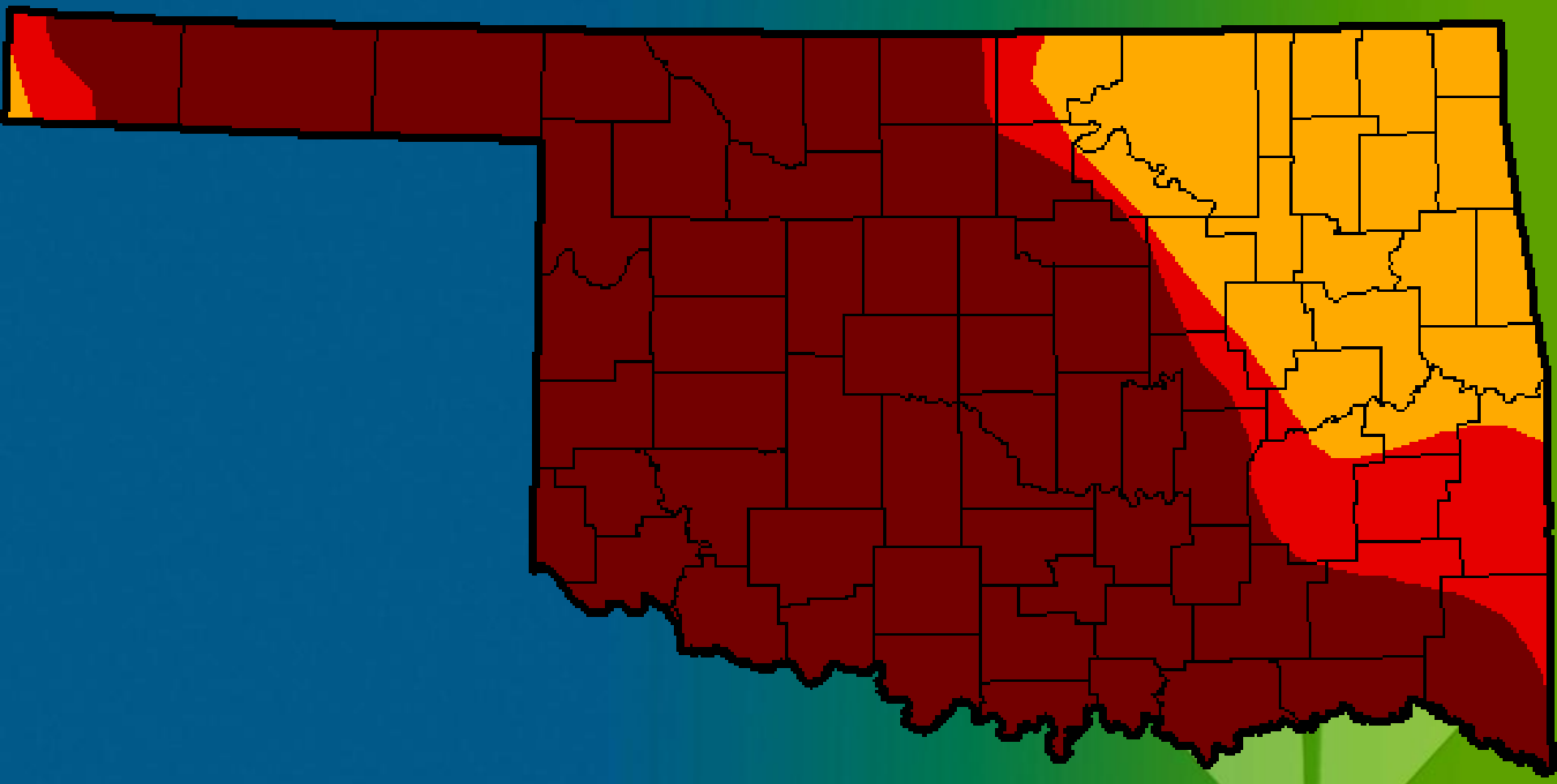

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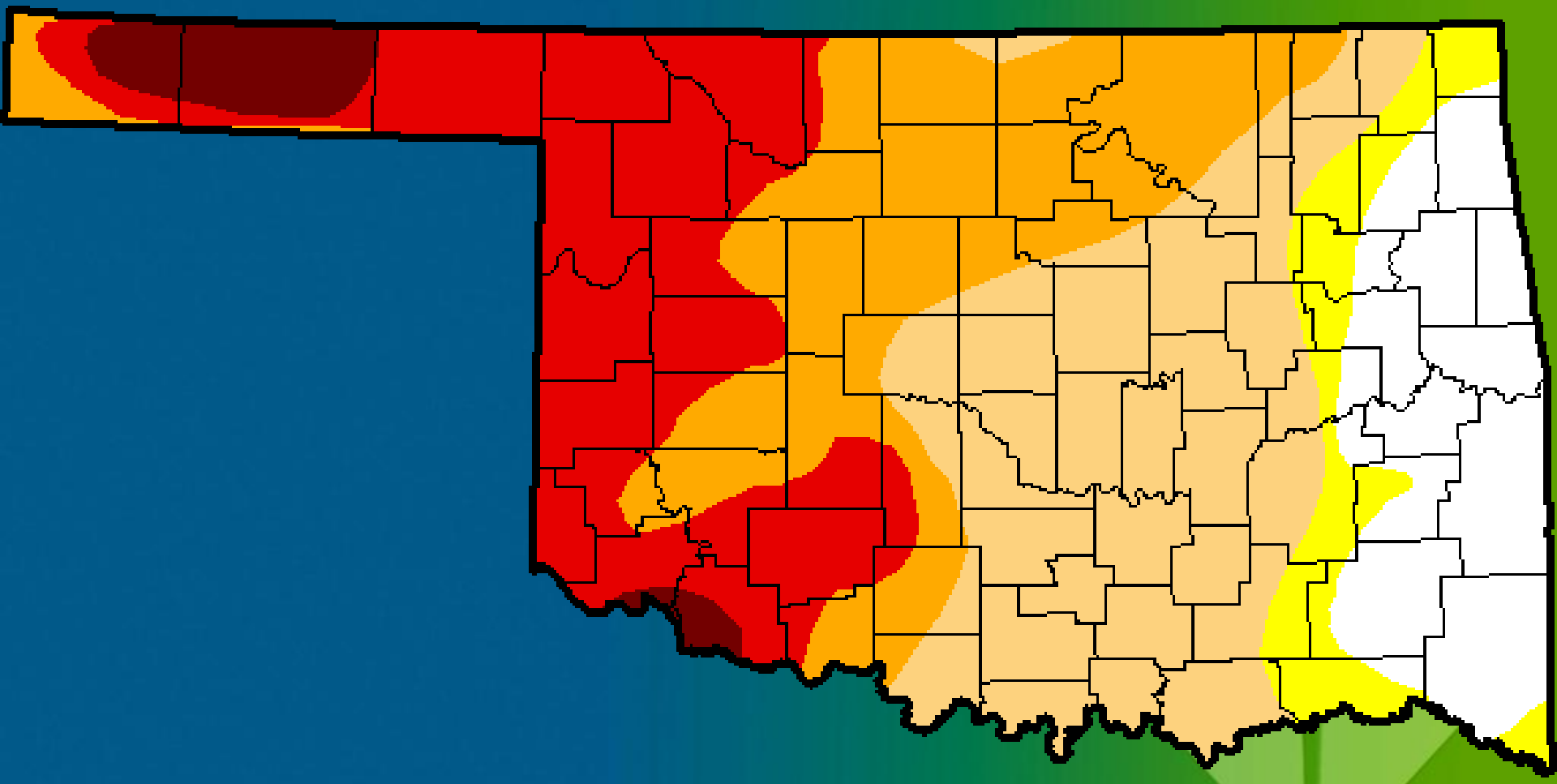

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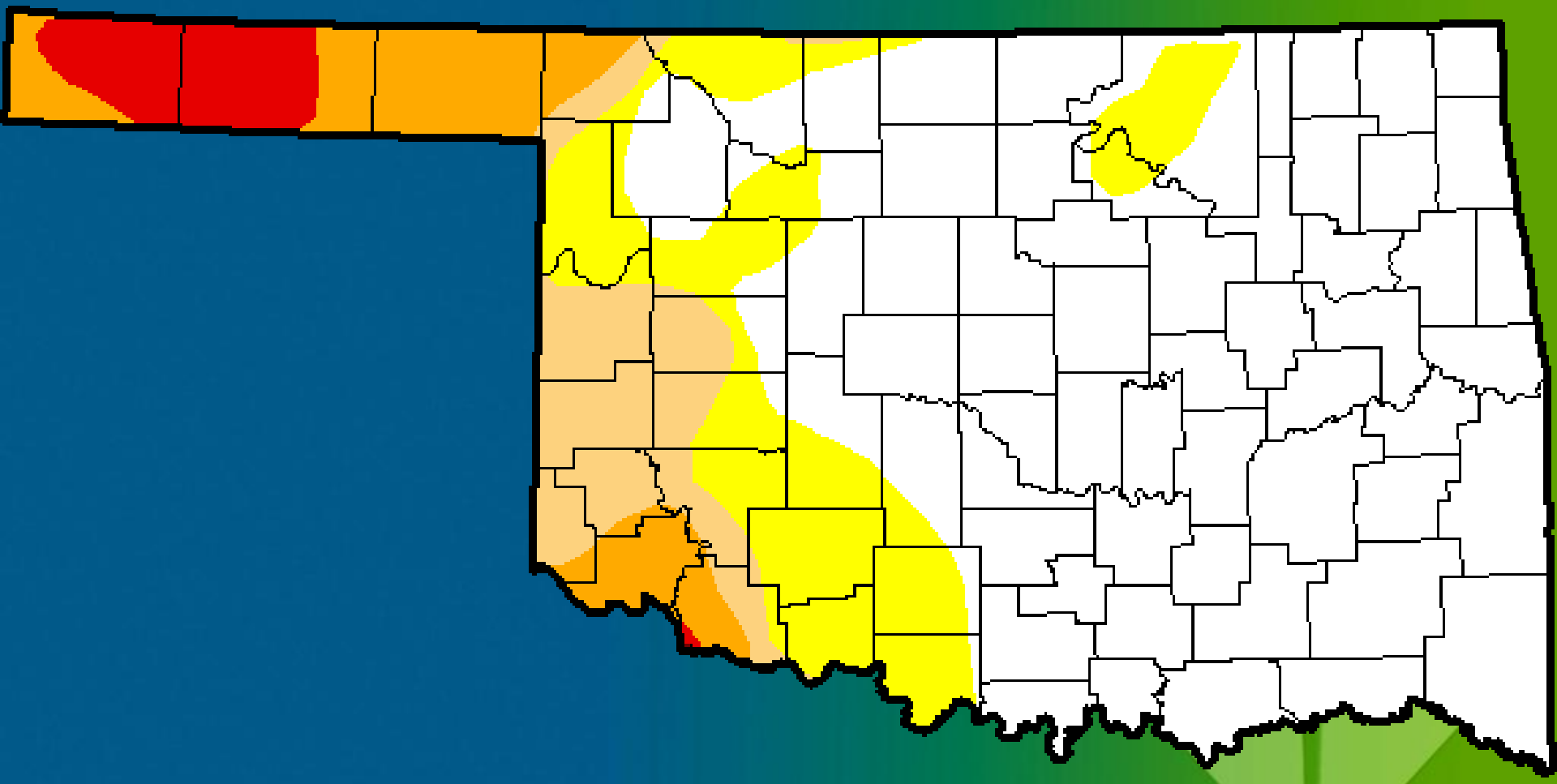

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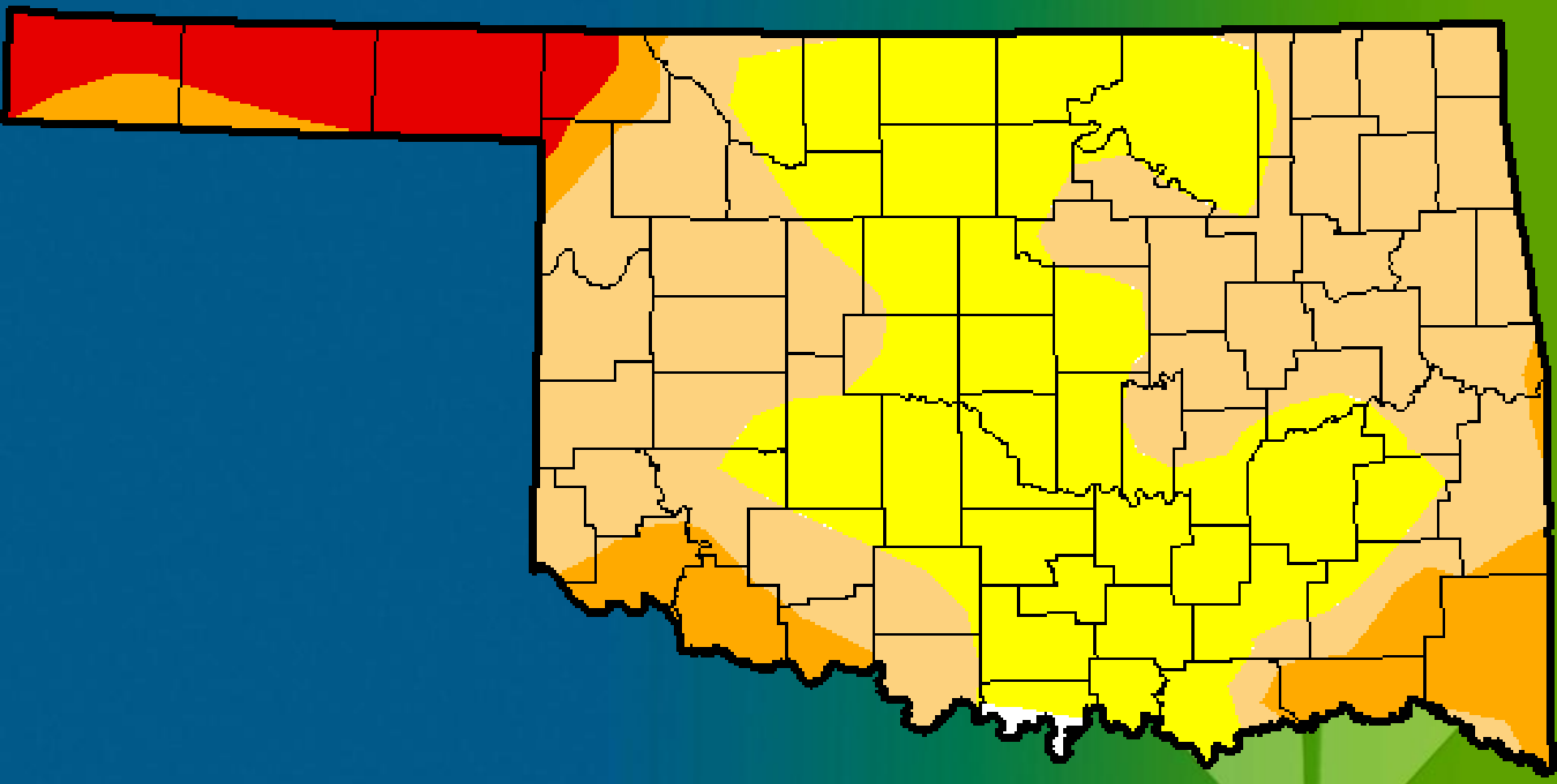
July 2012



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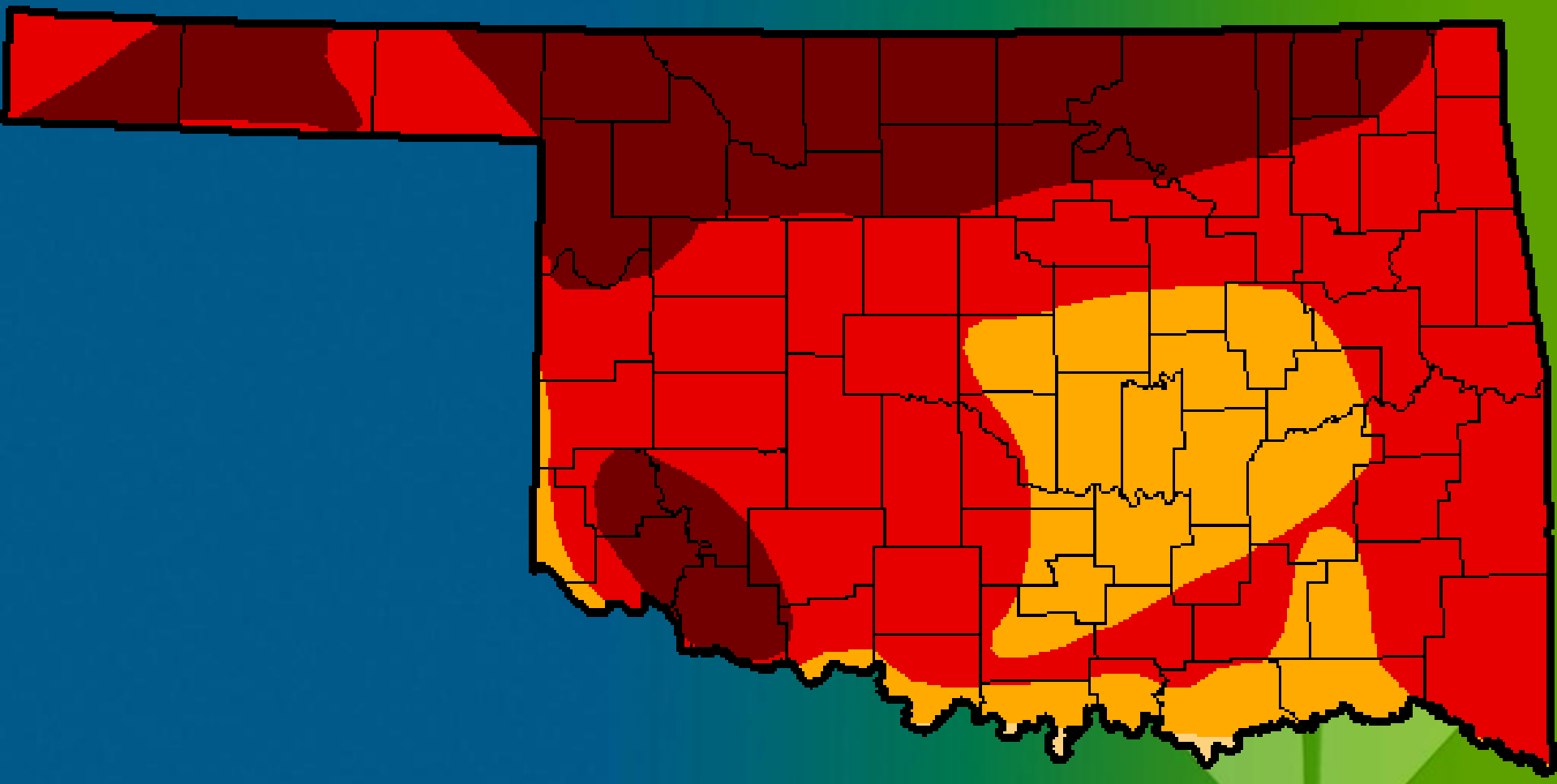
October 2012



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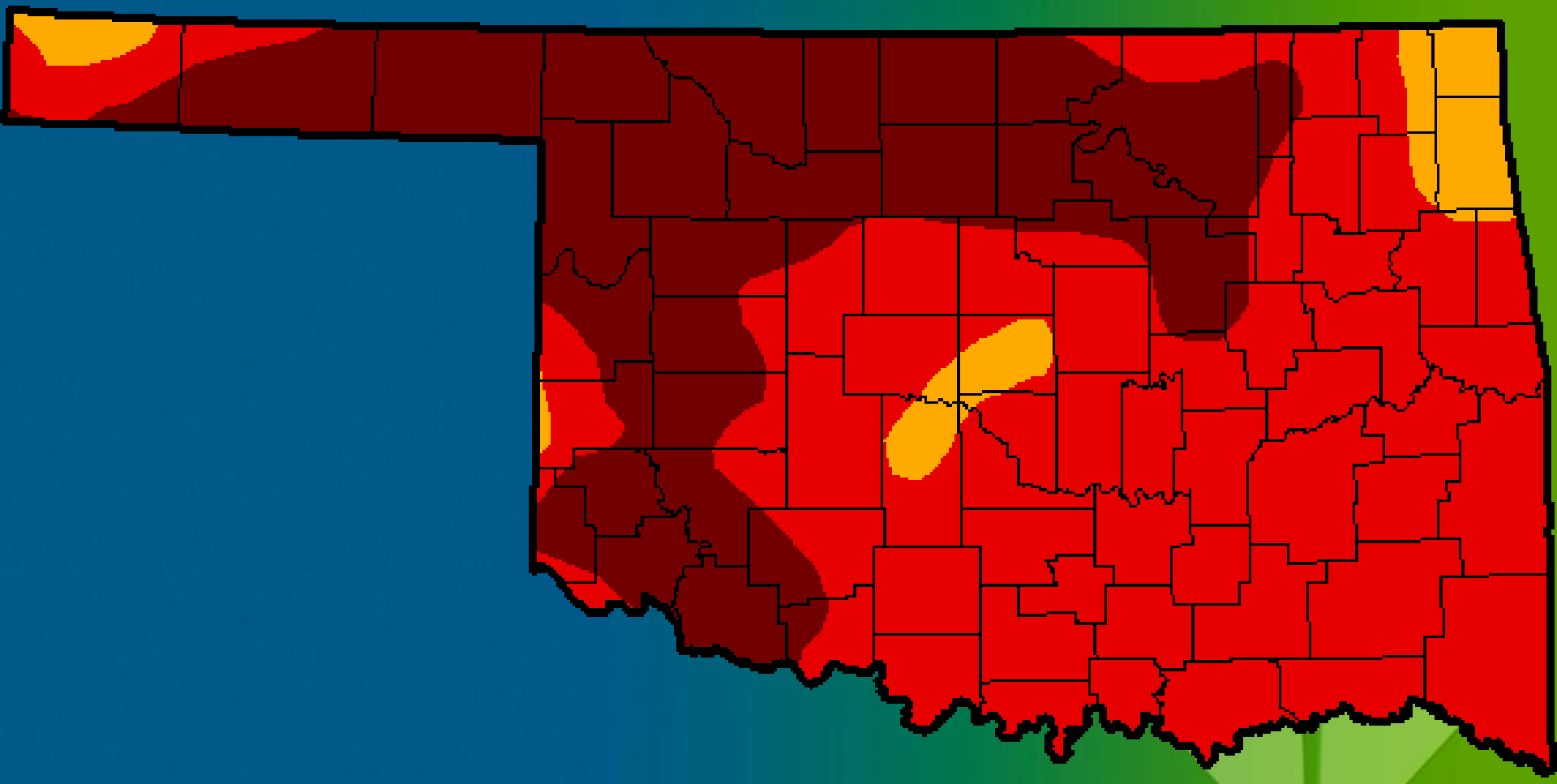

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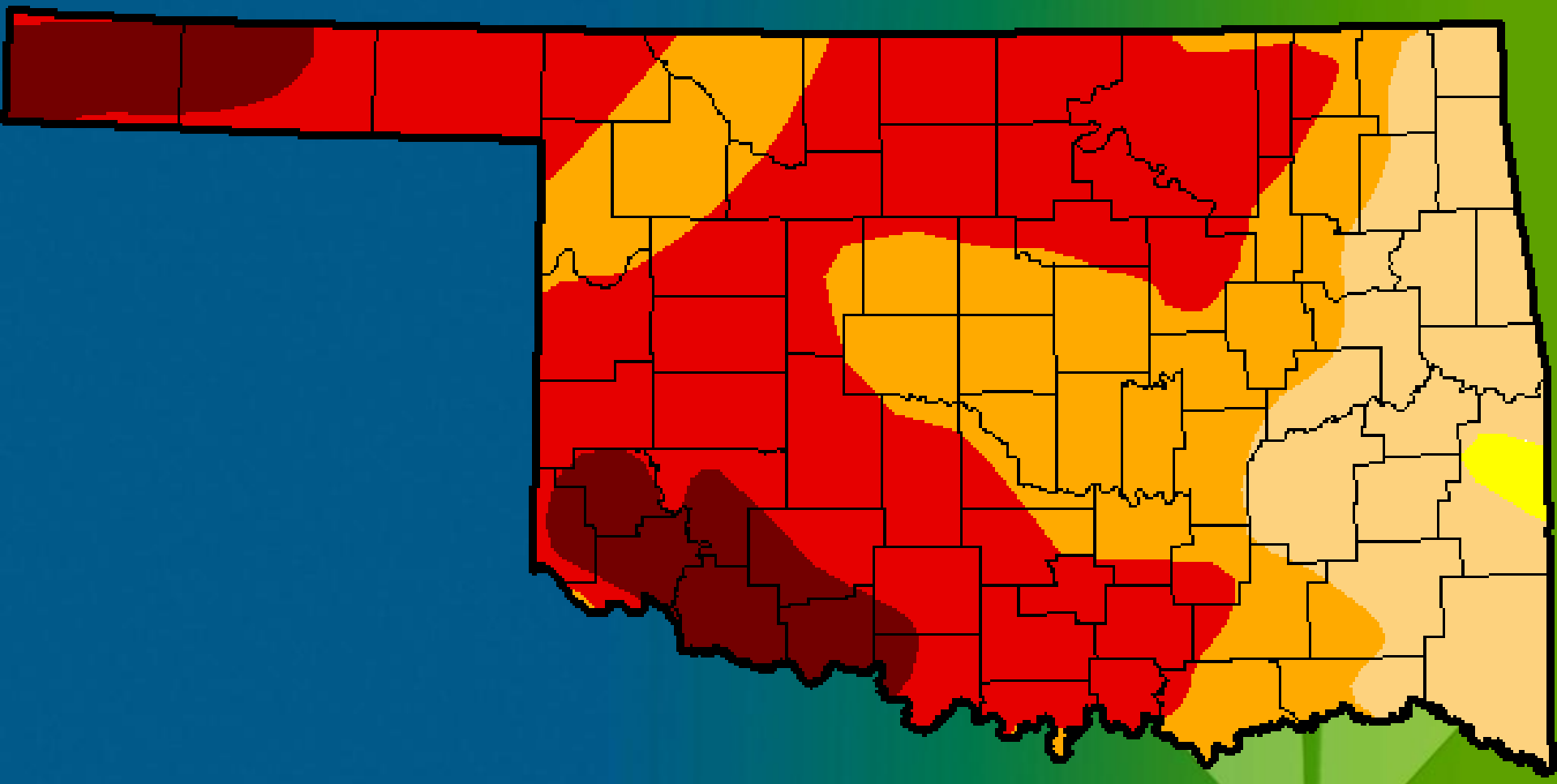

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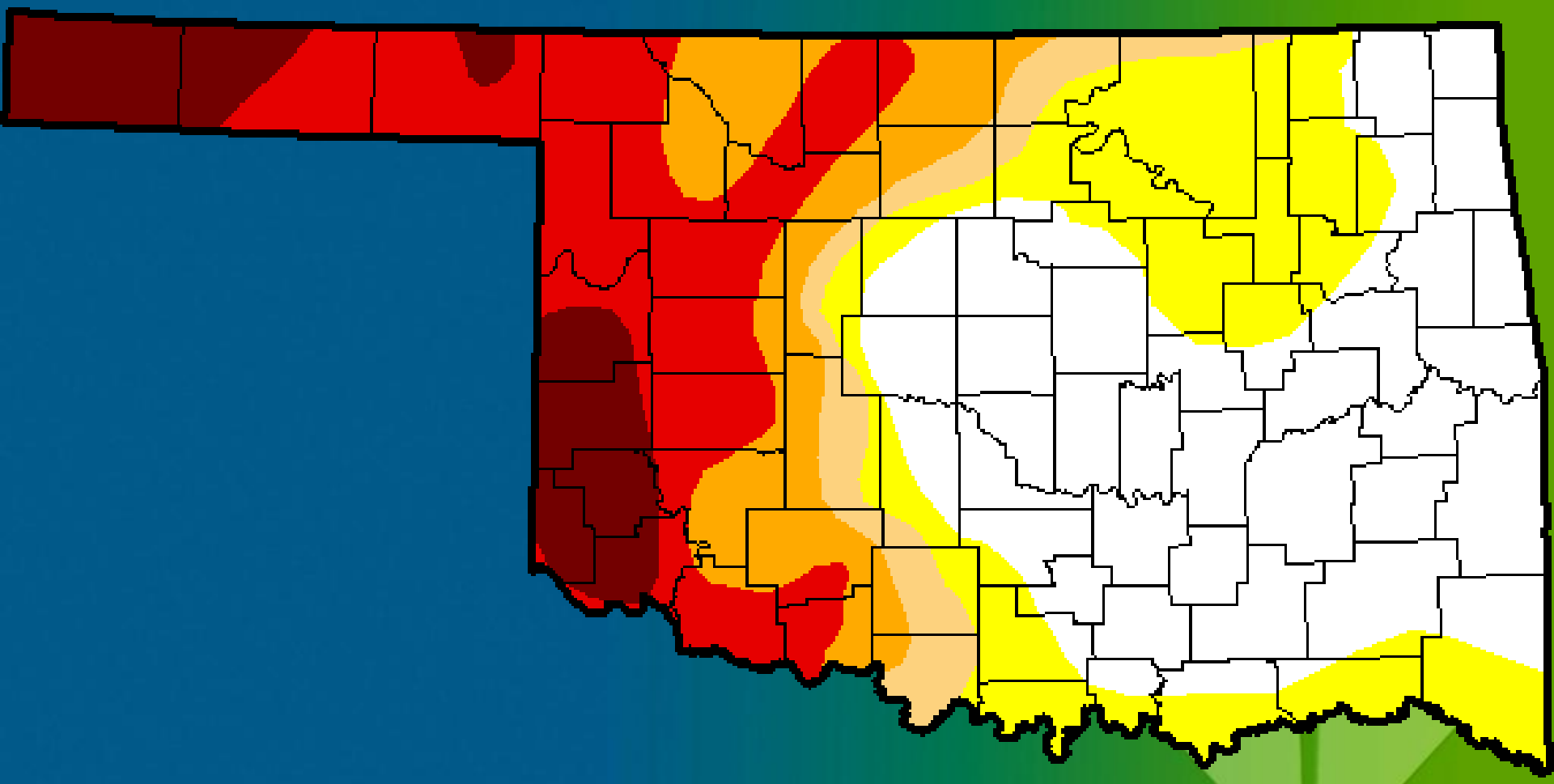

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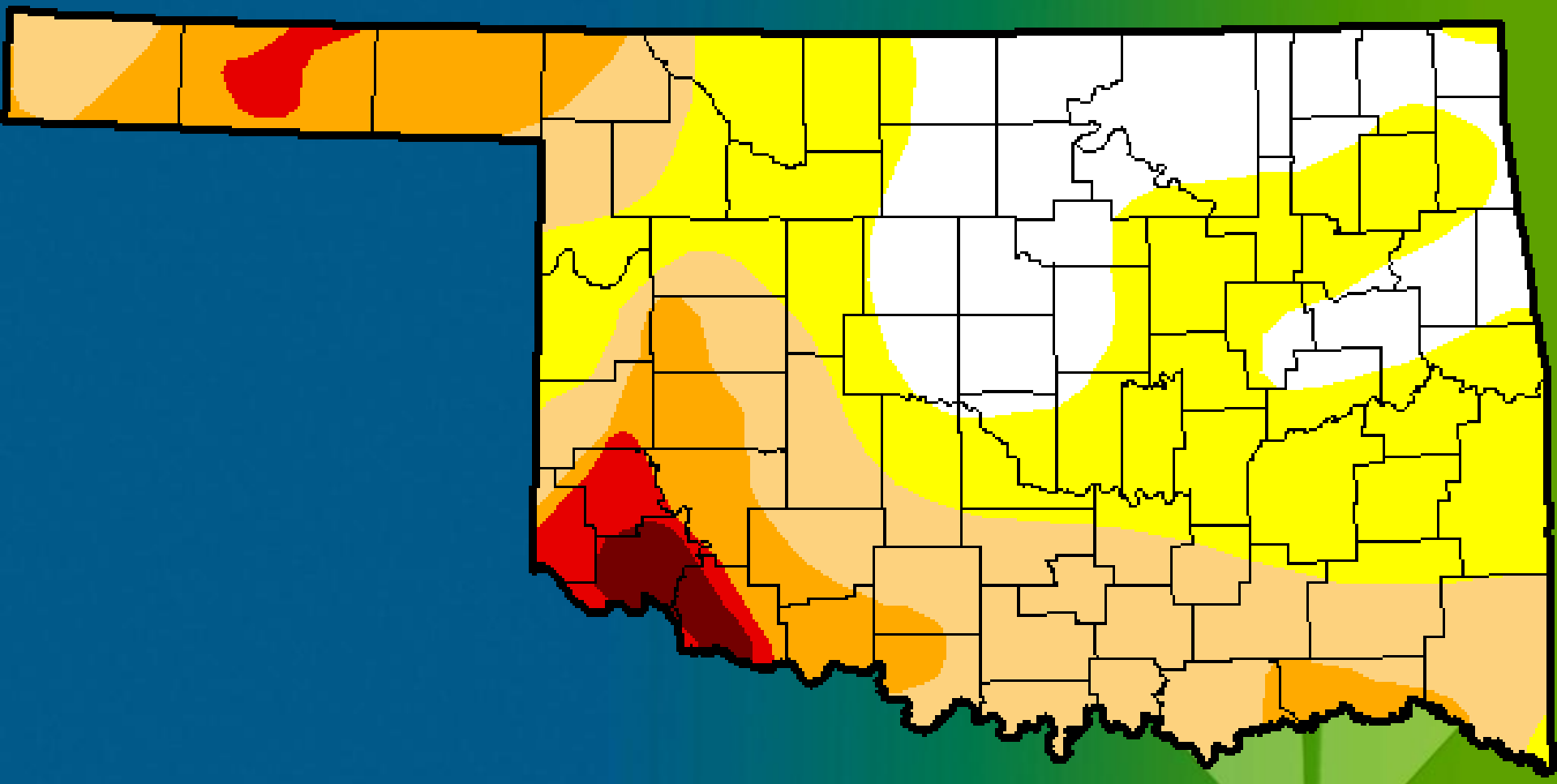

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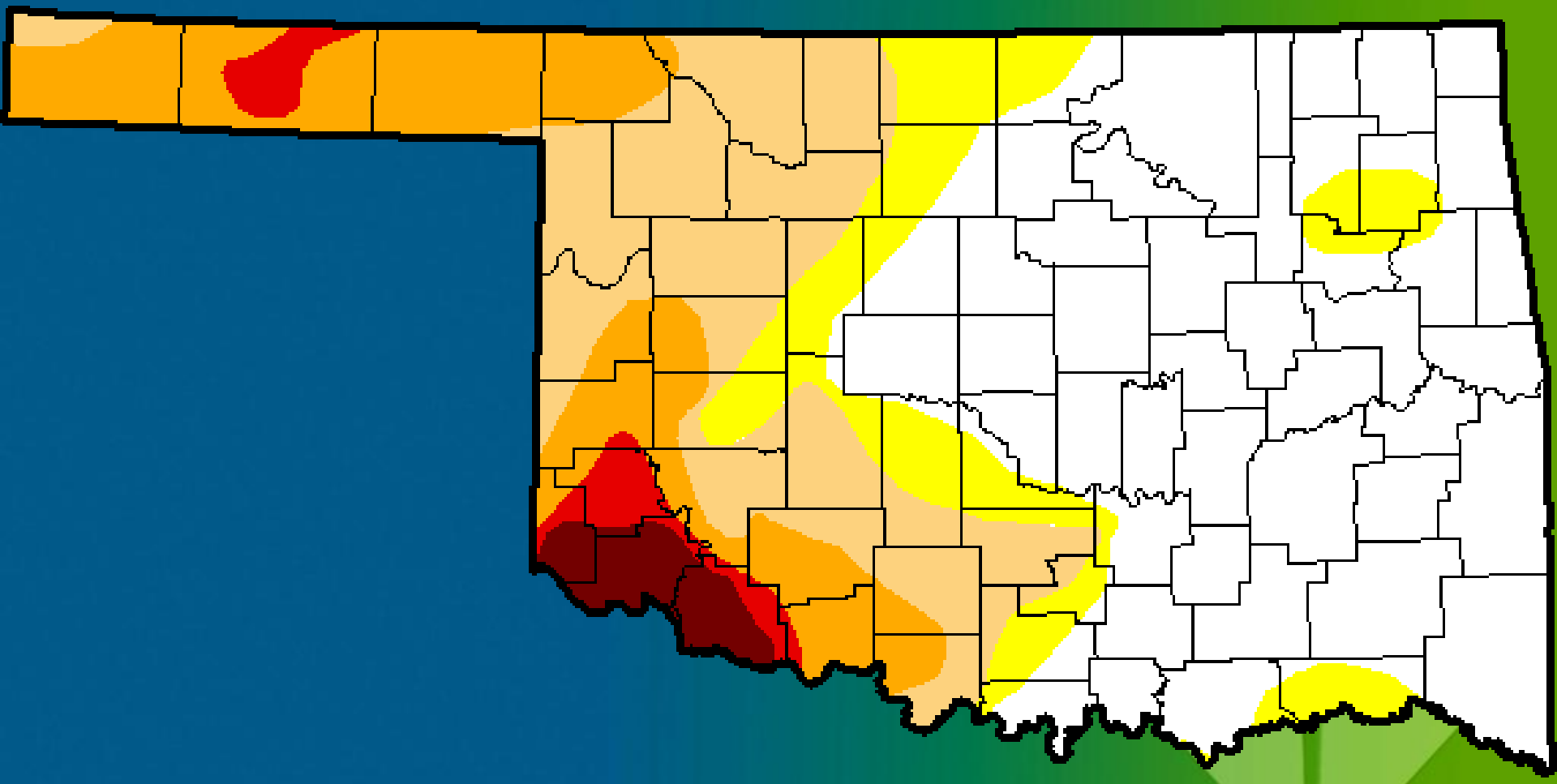
January 2014



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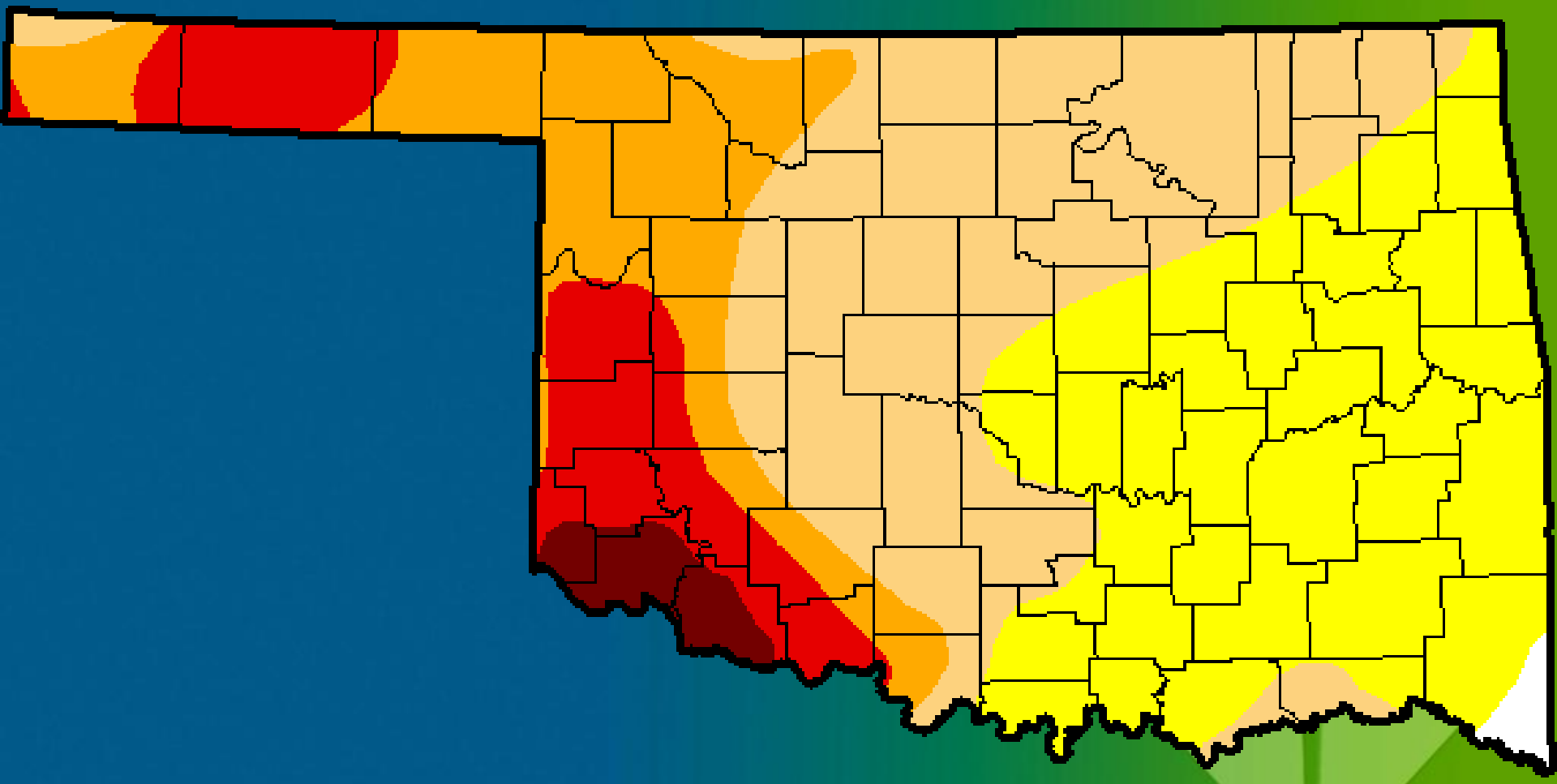
March 2014 (Current)



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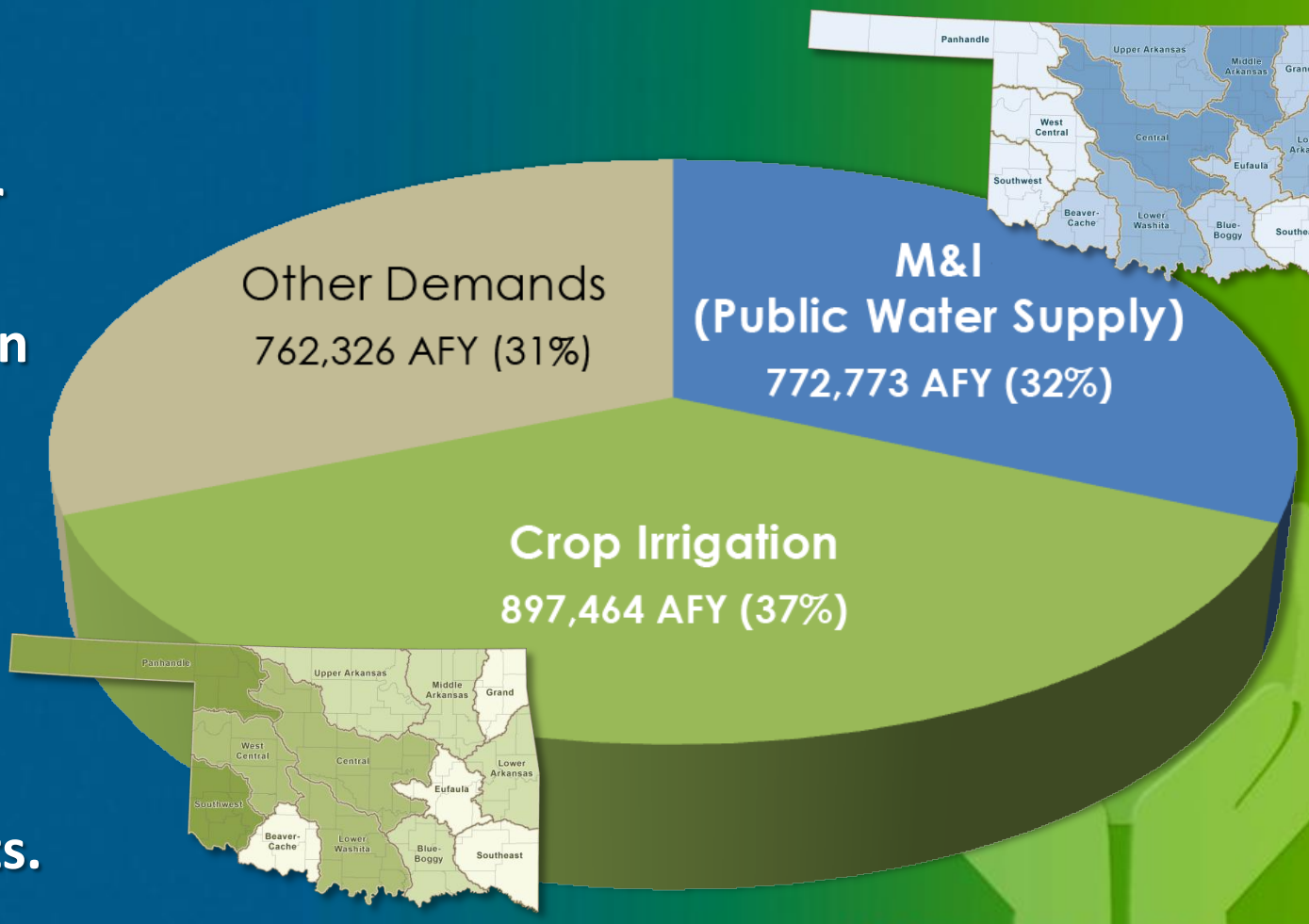
OCWP Water Conservation Analysis

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



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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

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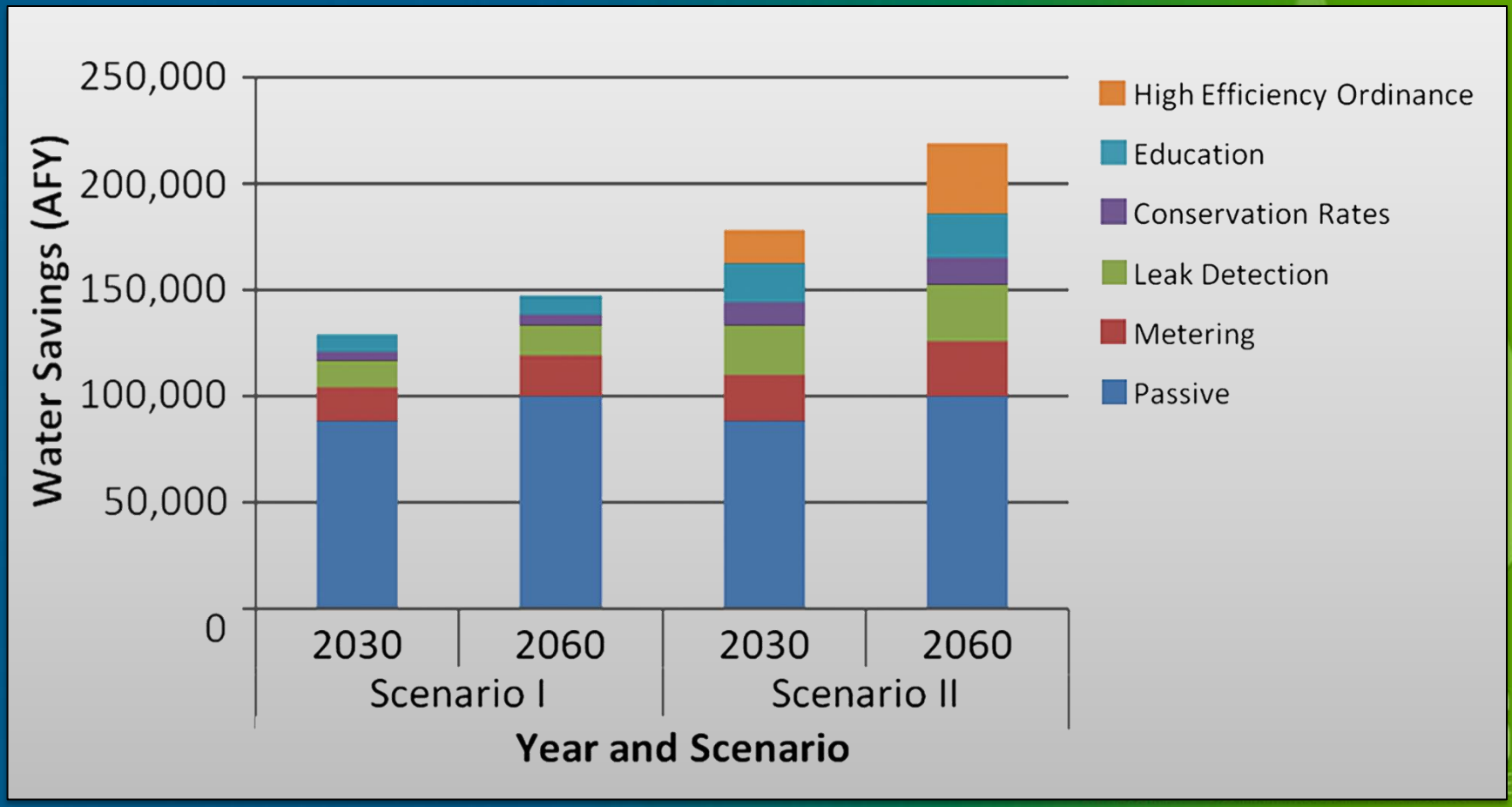
OCWP Water Conservation Analysis

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.

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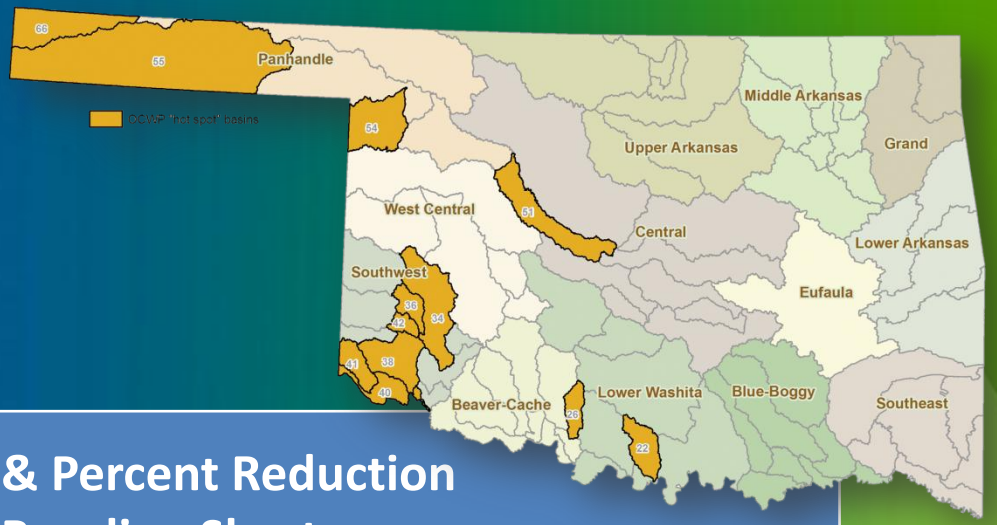
OCWP Water Conservation Analysis

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%

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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

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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

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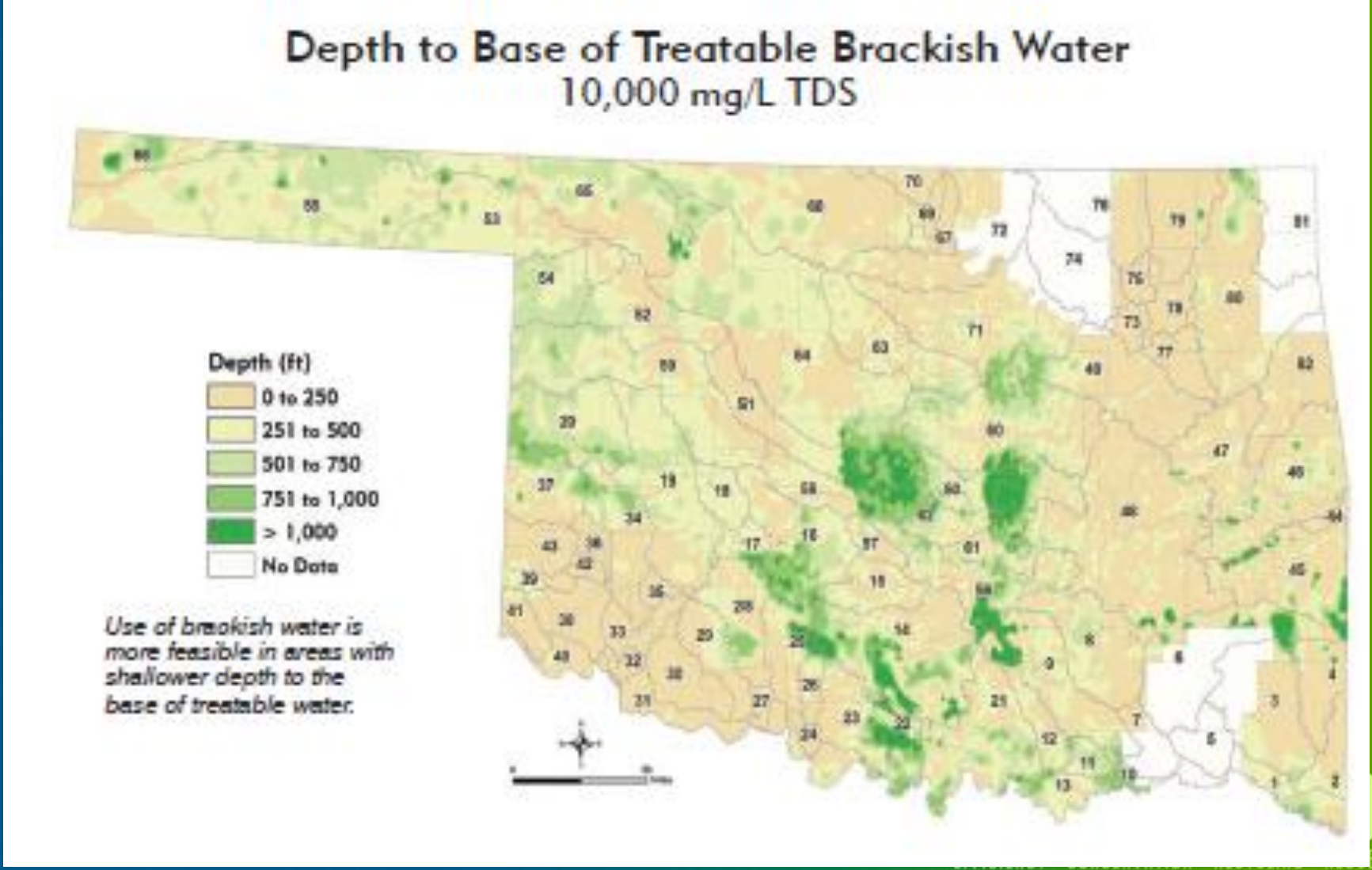
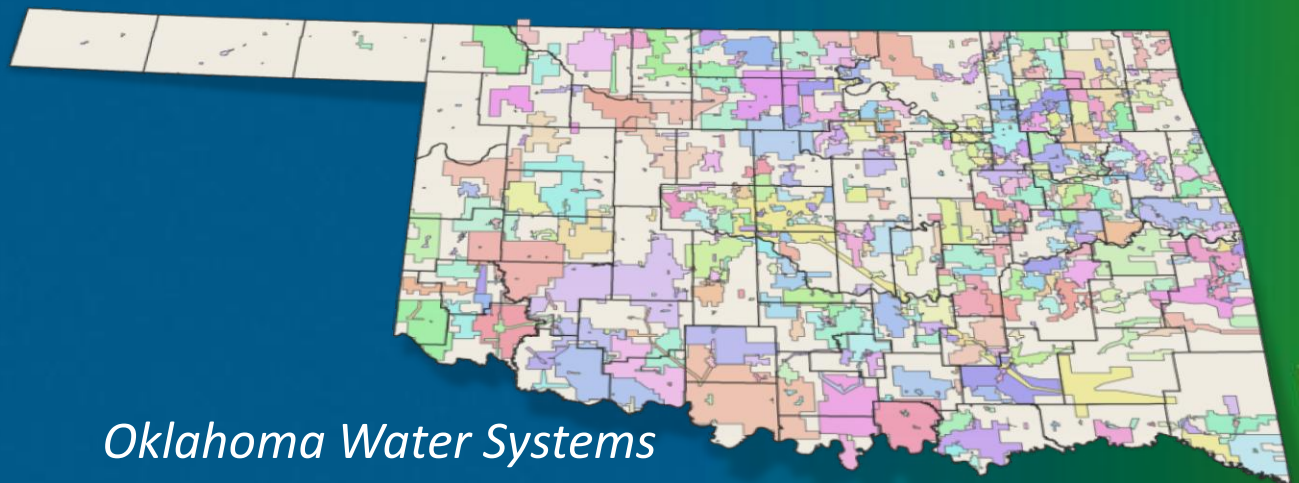
Example Marginal Quality Source: Brackish Water



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



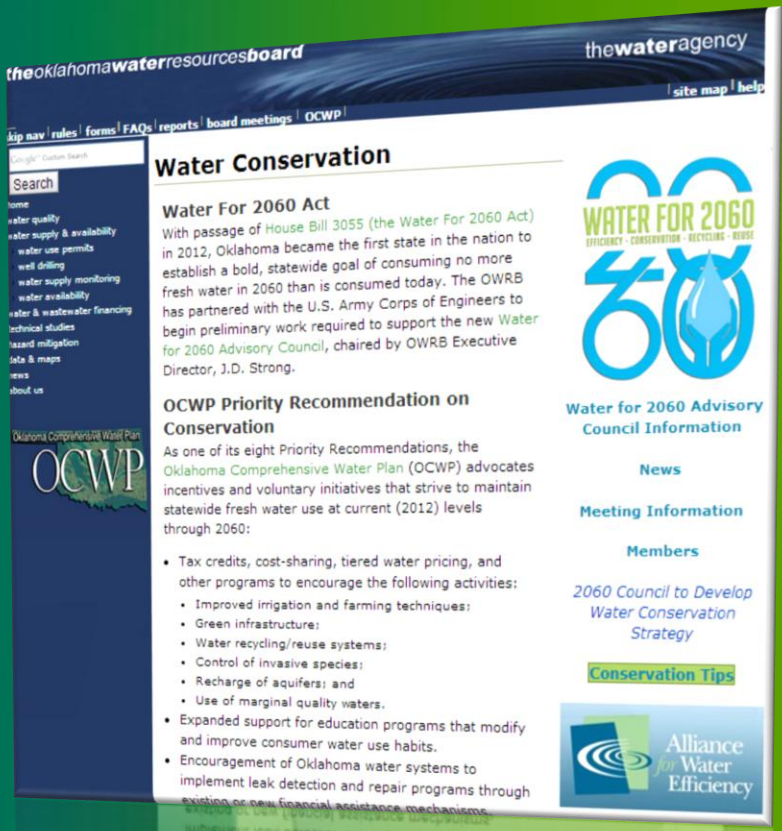
Oklahoma Water Systems

WATER FOR 2060

EFFICIENCY - CONSERVATION - RECYCLING - REUSE

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



WATER FOR 2060
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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

WATER FOR 2060

EFFICIENCY - CONSERVATION - RECYCLING - REUSE

WATER FOR 2060
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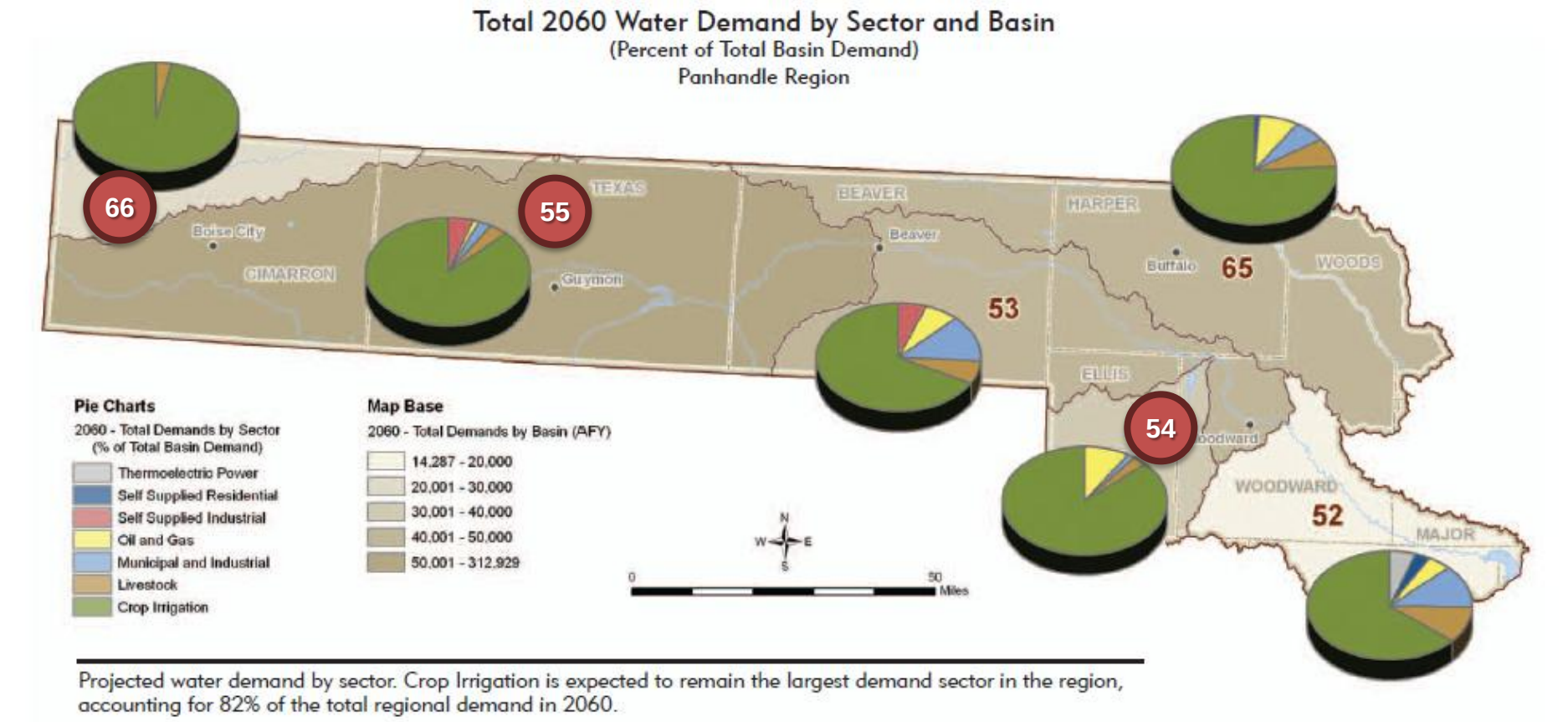
PANHANDLE SLIDES FOLLOW

WATER FOR 2060
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

Projected Water Demands



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

WATER FOR 2060
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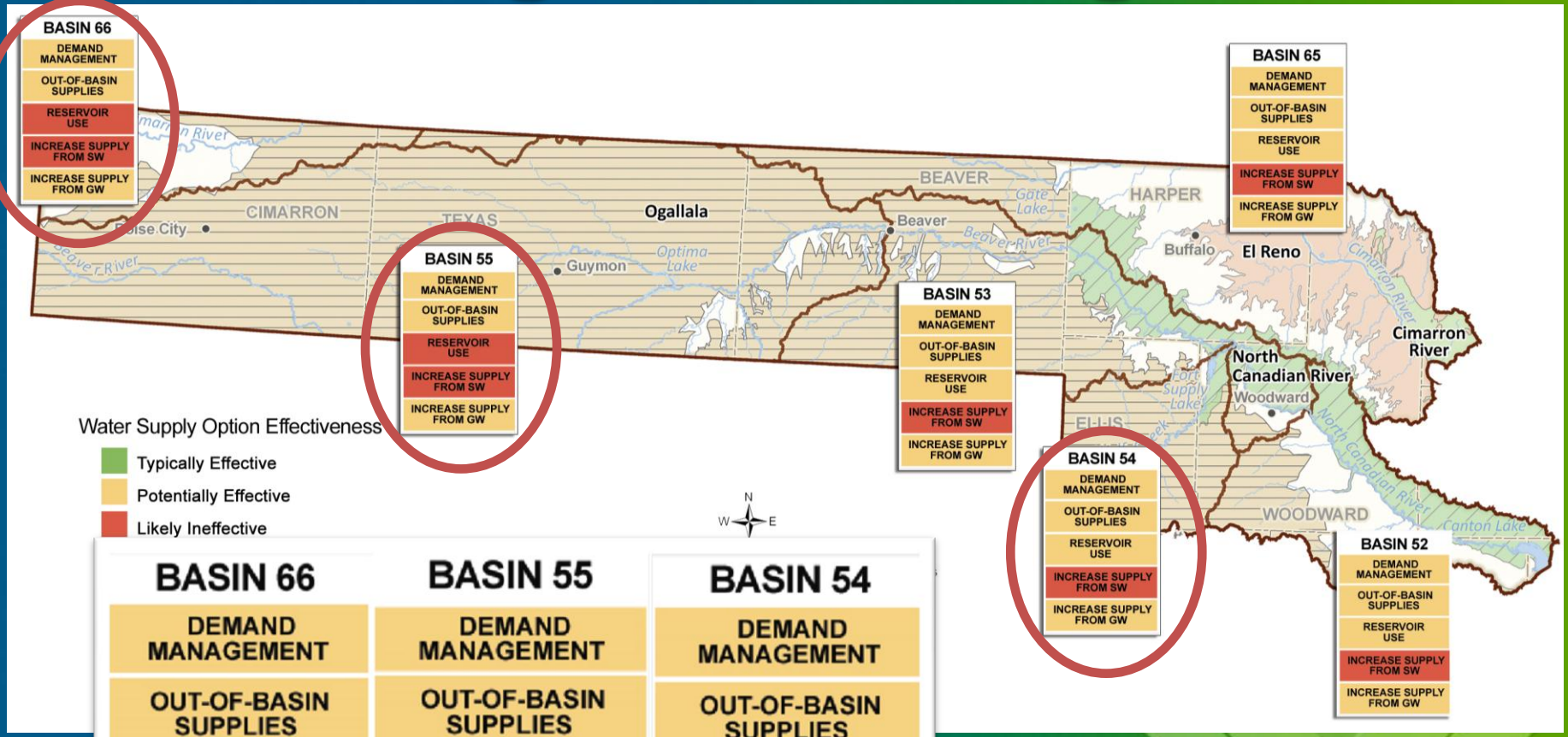
Feasibility of Supplies and Water Management Strategies



BASIN 66	BASIN 55	BASIN 54
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

WATER FOR 2060
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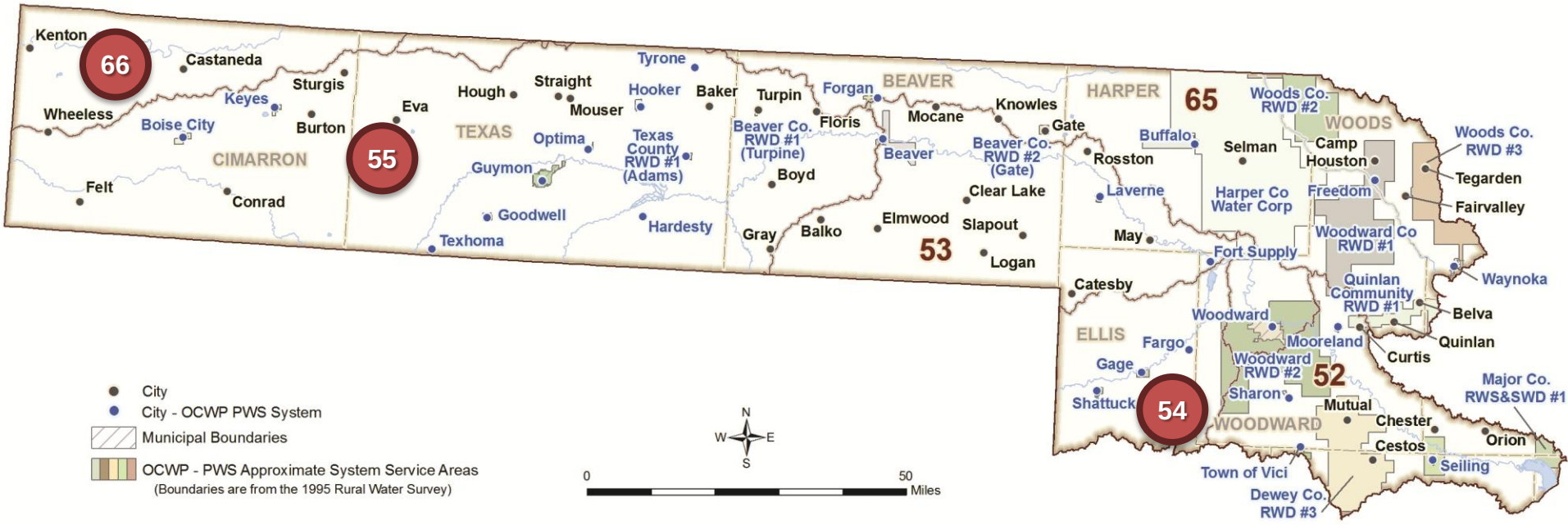
Public Water Supply Regionalization
Panhandle Region Municipal & Rural Water Systems



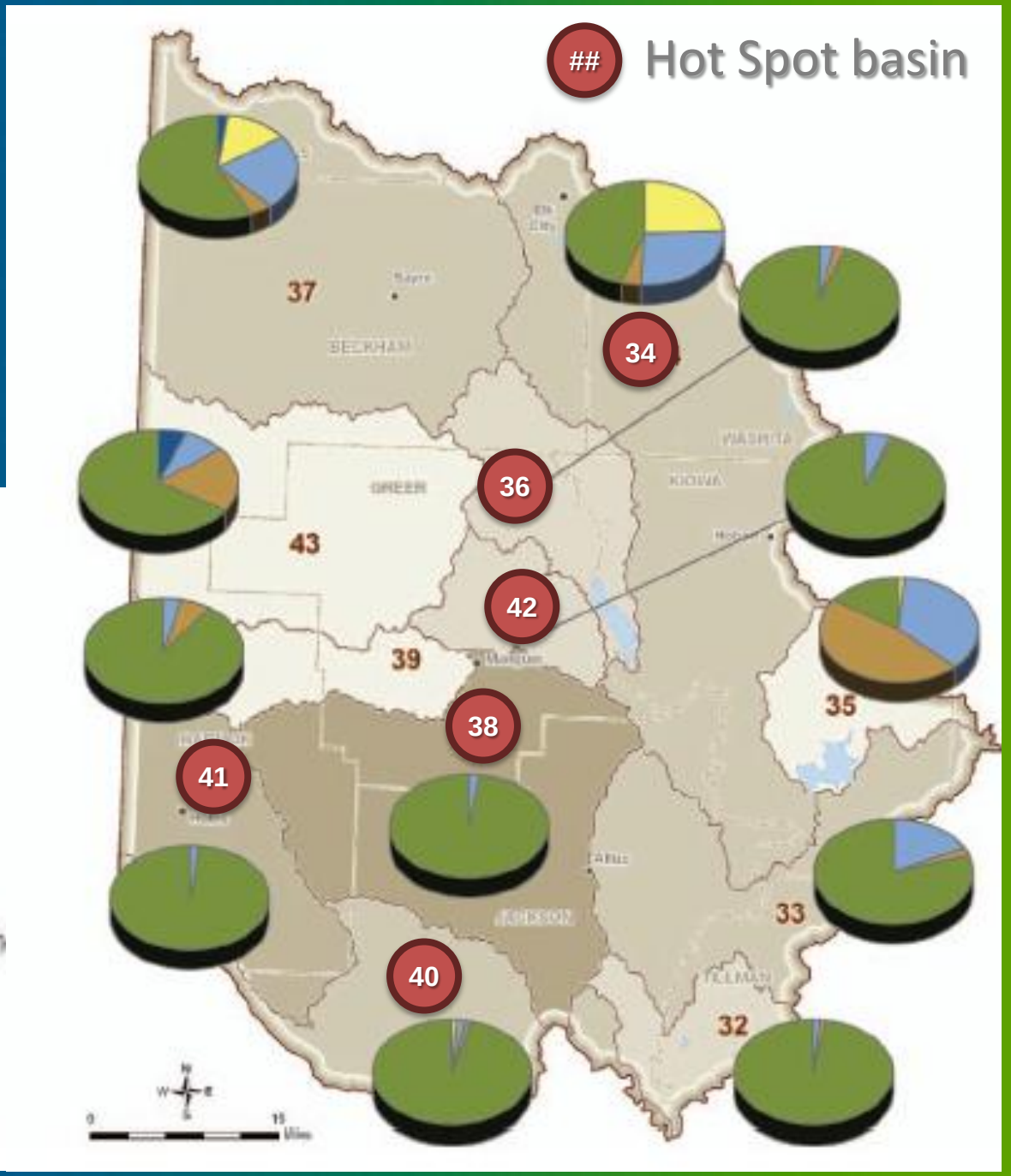
Hot Spot basin

WATER FOR 2060
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

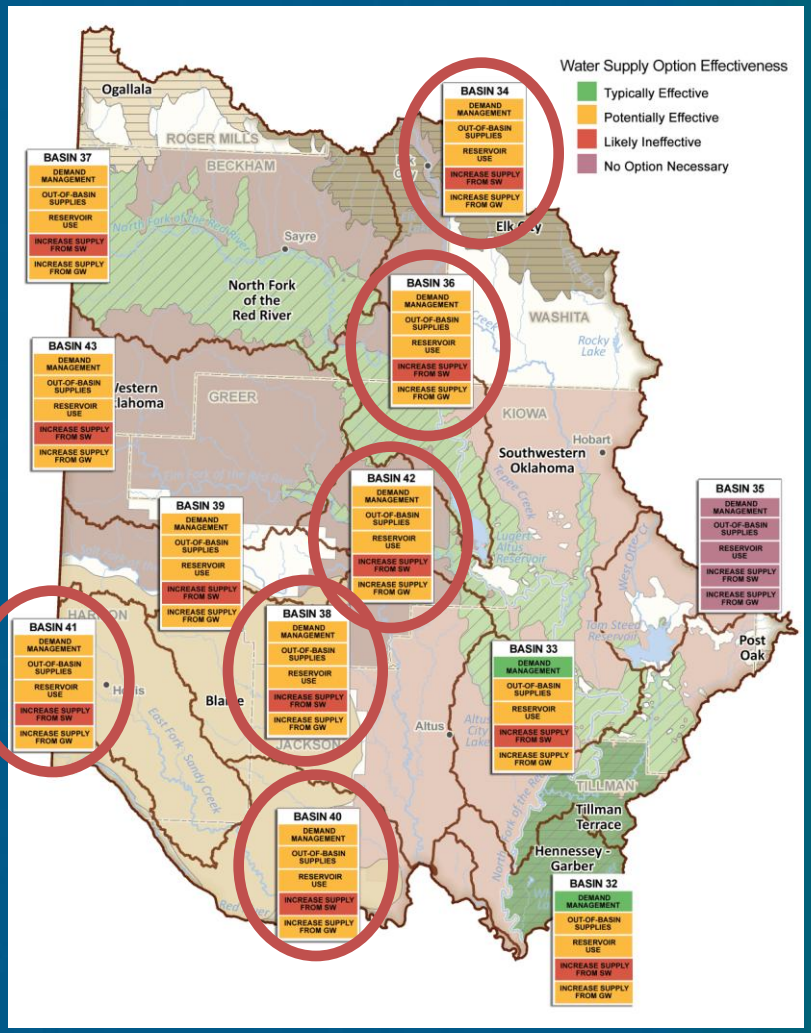
SOUTHWEST SLIDES FOLLOW

WATER FOR 2060
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

Projected Water Demands



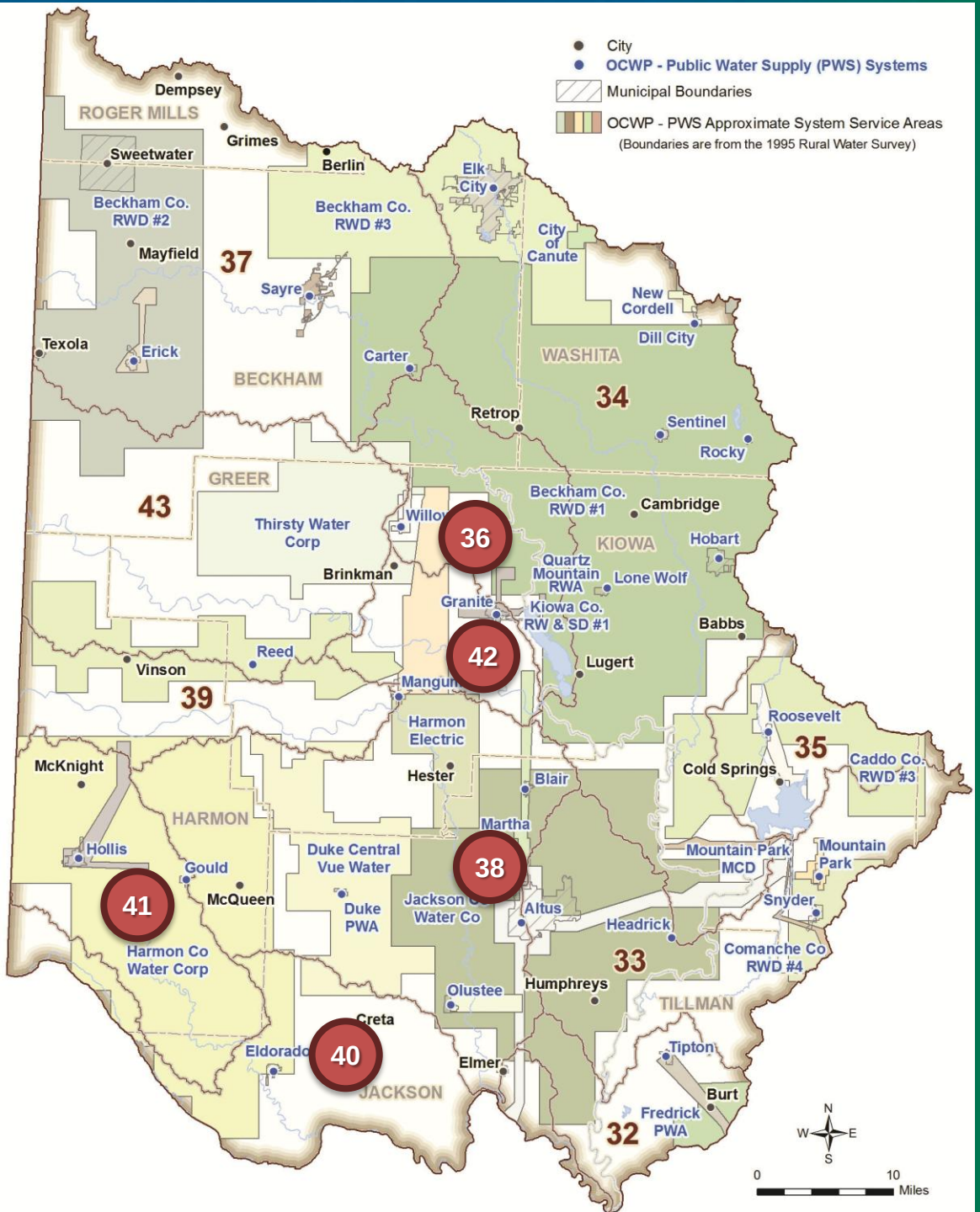
Feasibility of Supplies and Water Management Strategies



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

WATER FOR 2060
EFFICIENCY - CONSERVATION - RECYCLING - REUSE



Public Water Supply Regionalization

Southwest Region Municipal & Rural Water Systems

Hot Spot basin

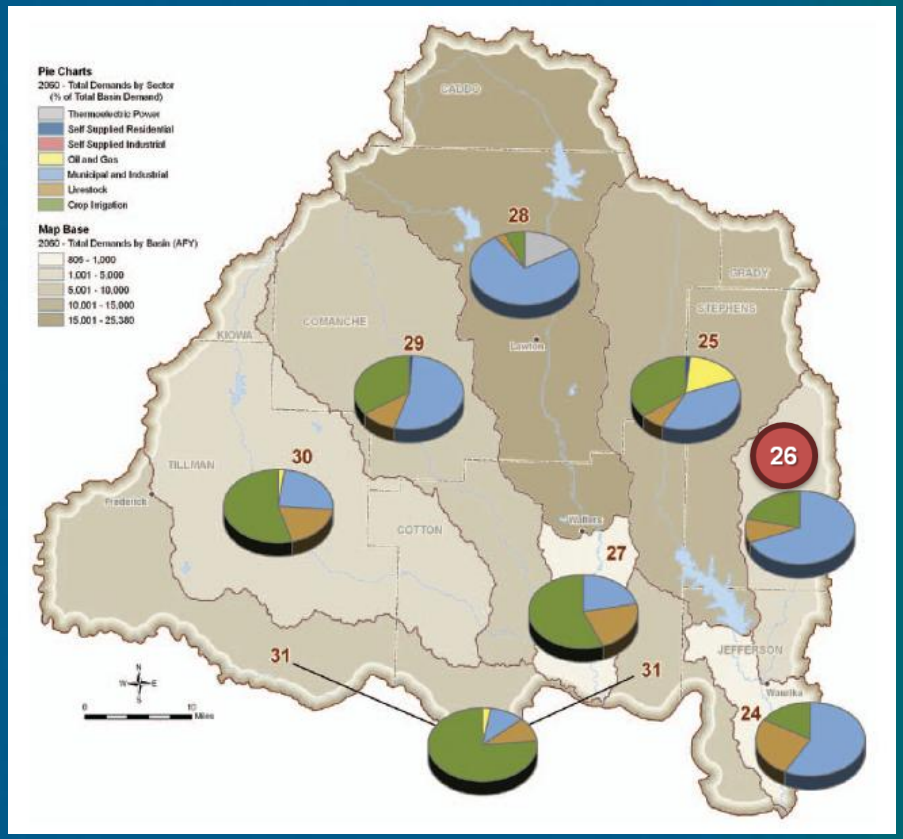
WATER FOR 2060

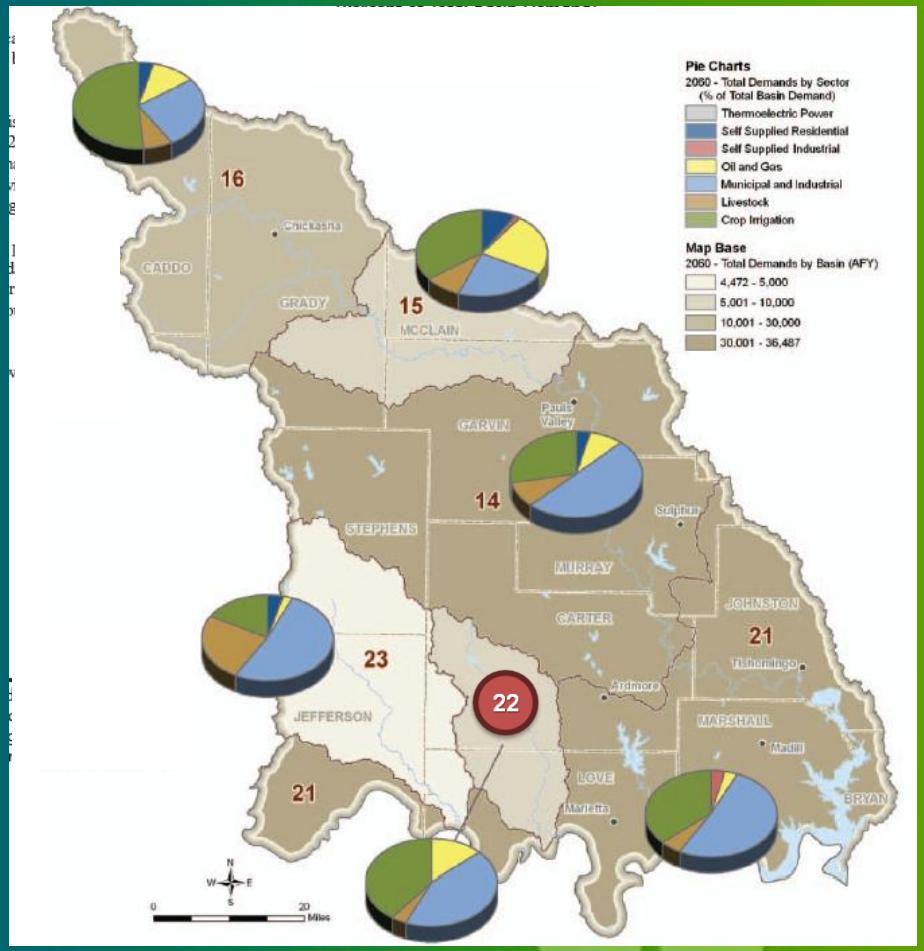
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

BEAVER-CACHE AND LOWER WASHITA SLIDES FOLLOW

WATER FOR 2060
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

Projected Water Demands





Hot Spot basin

WATER FOR 2060
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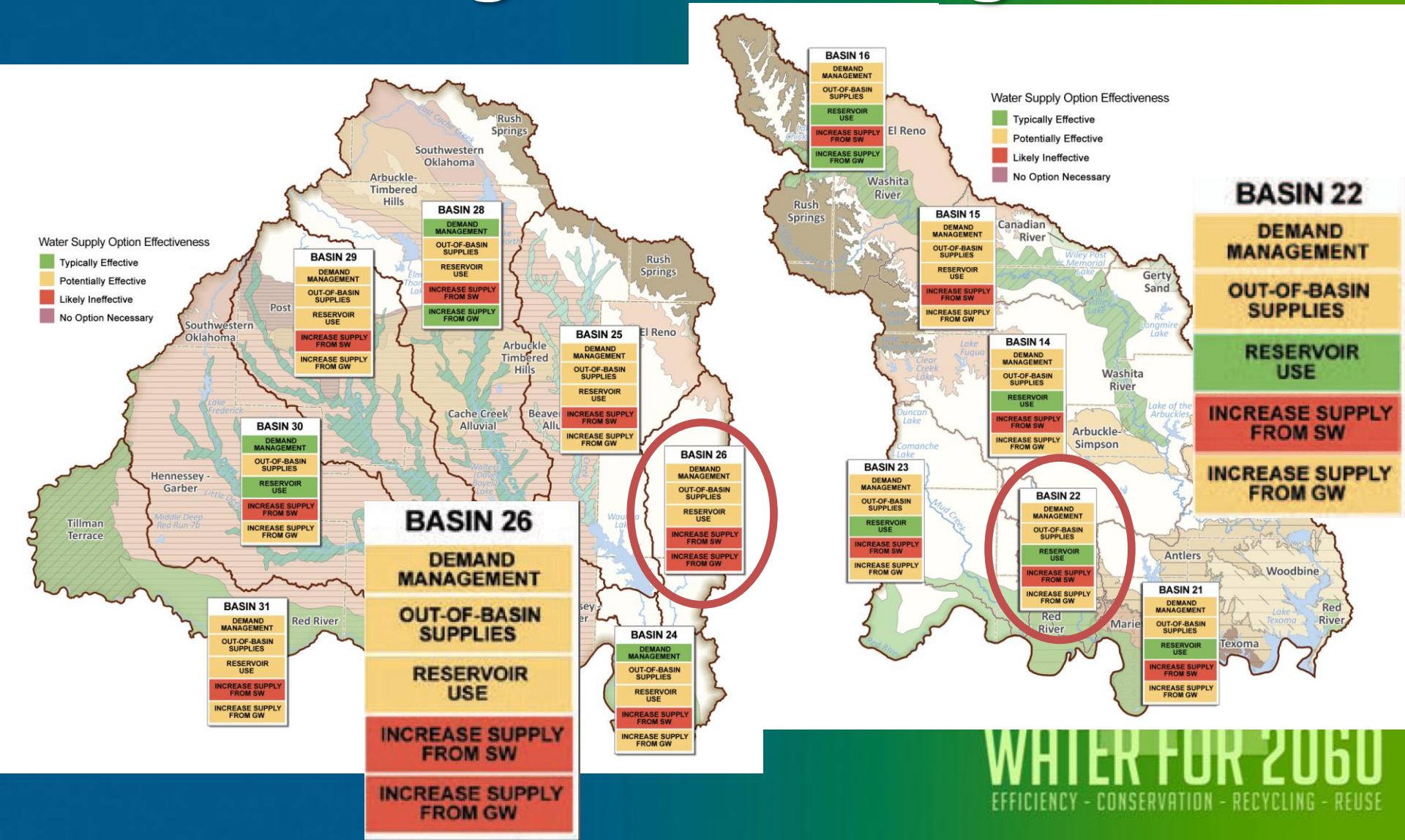
Feasibility of Supplies and Water Management Strategies



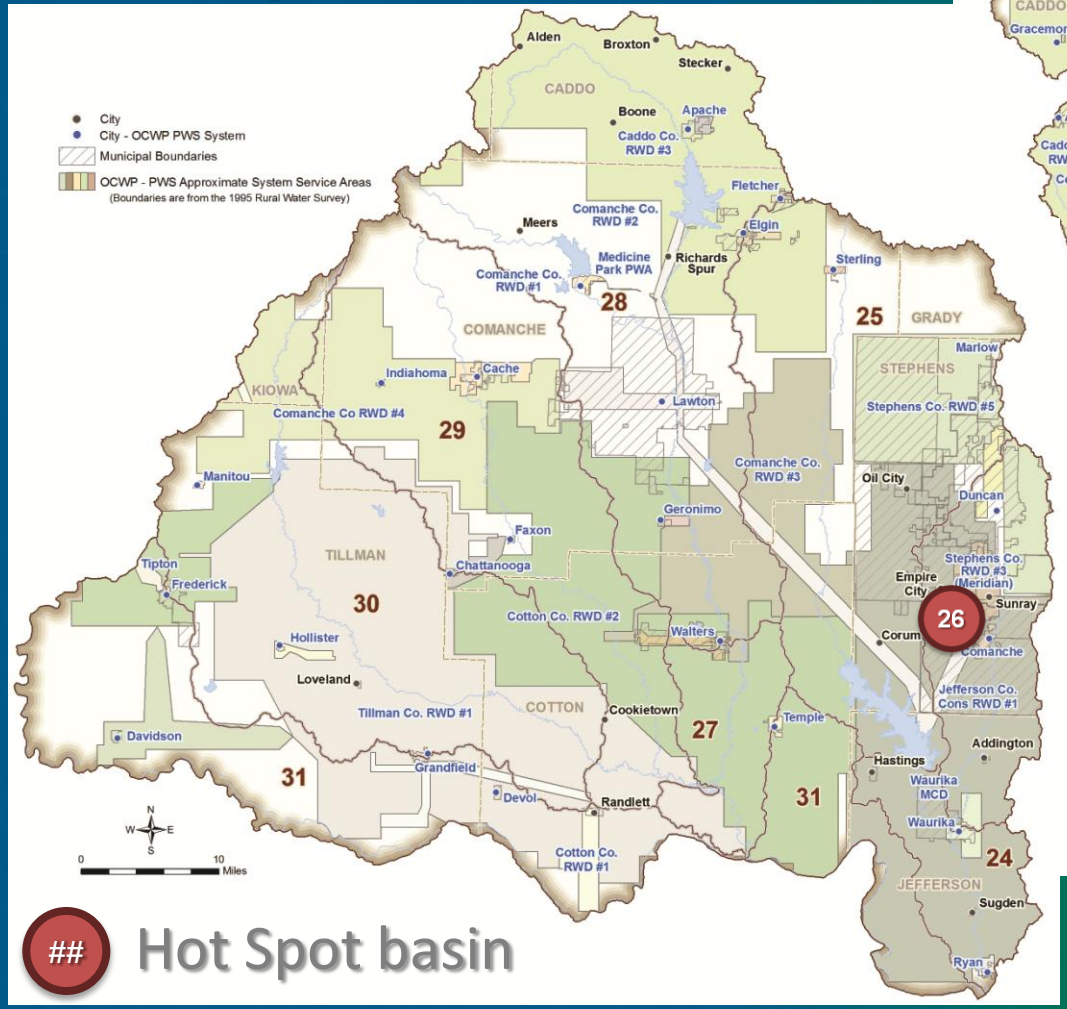
WATER FOR 2060

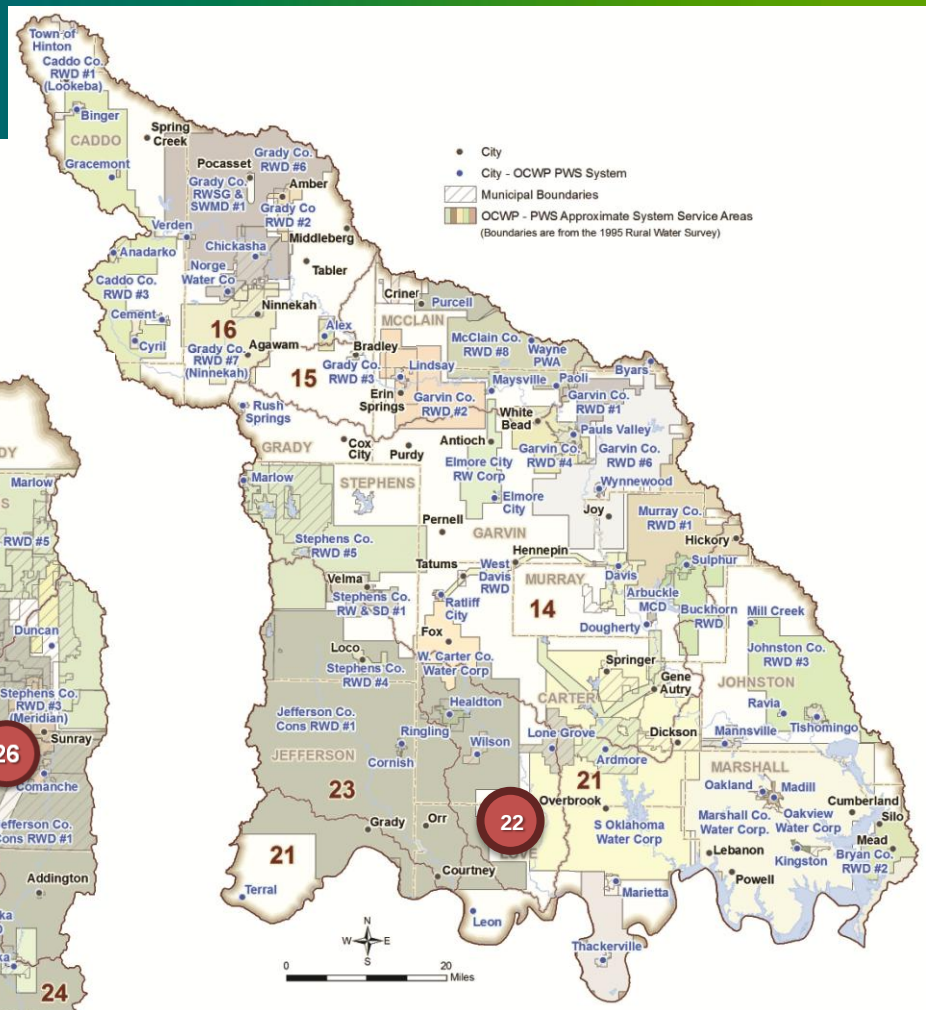
EFFICIENCY - CONSERVATION - RECYCLING - REUSE

Public Water Supply Regionalization

Beaver-Cache & Lower Washita Regions

Municipal & Rural Water Systems





WATER FOR 2060

EFFICIENCY - CONSERVATION - RECYCLING - REUSE