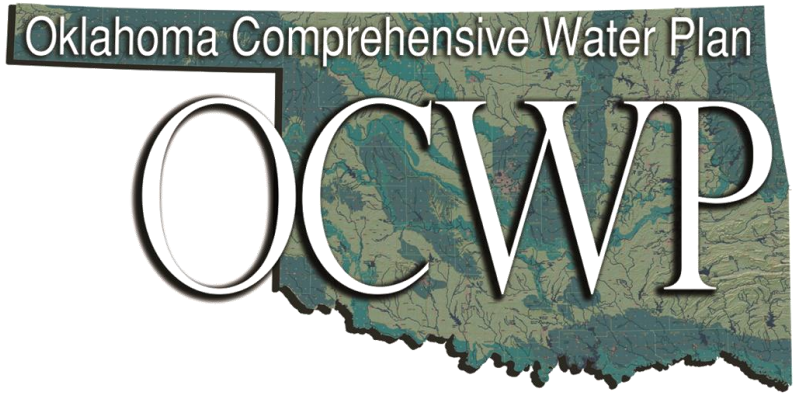


OCWP Panel #2:
Demand, Hot Spots and Water Supply Options

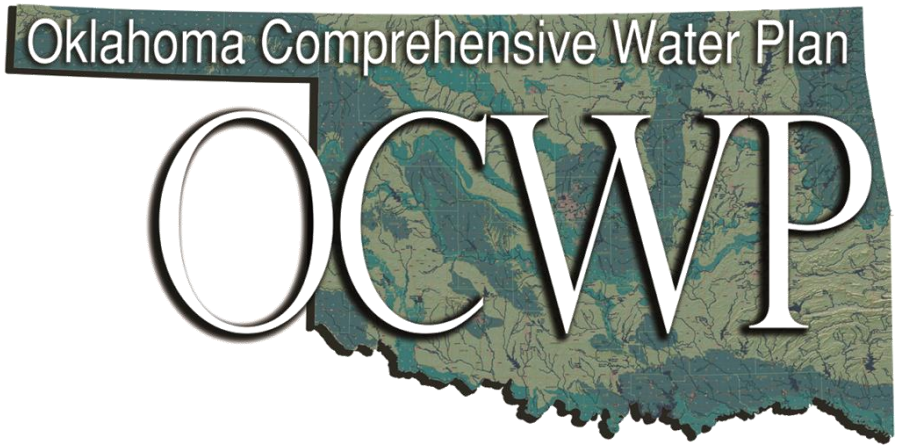
Jessica Fritsche - CDM
Dan Reisinger - CDM

Governor's Water Conference
Norman, Oklahoma
October 18, 2011

US Army Corps of Engineers

State of Oklahoma
OWRB
Water Resources Board
the water agency

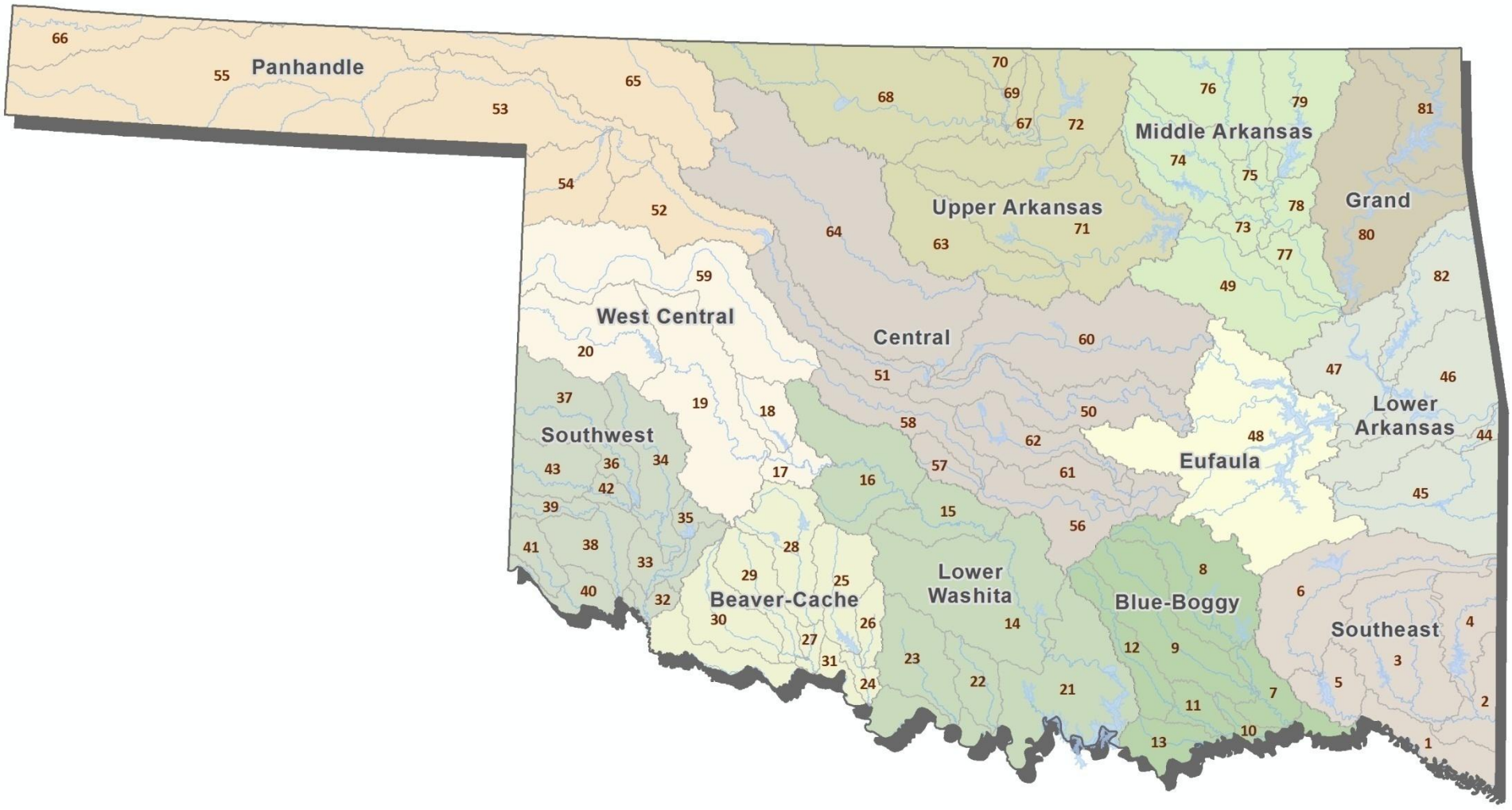
CDM



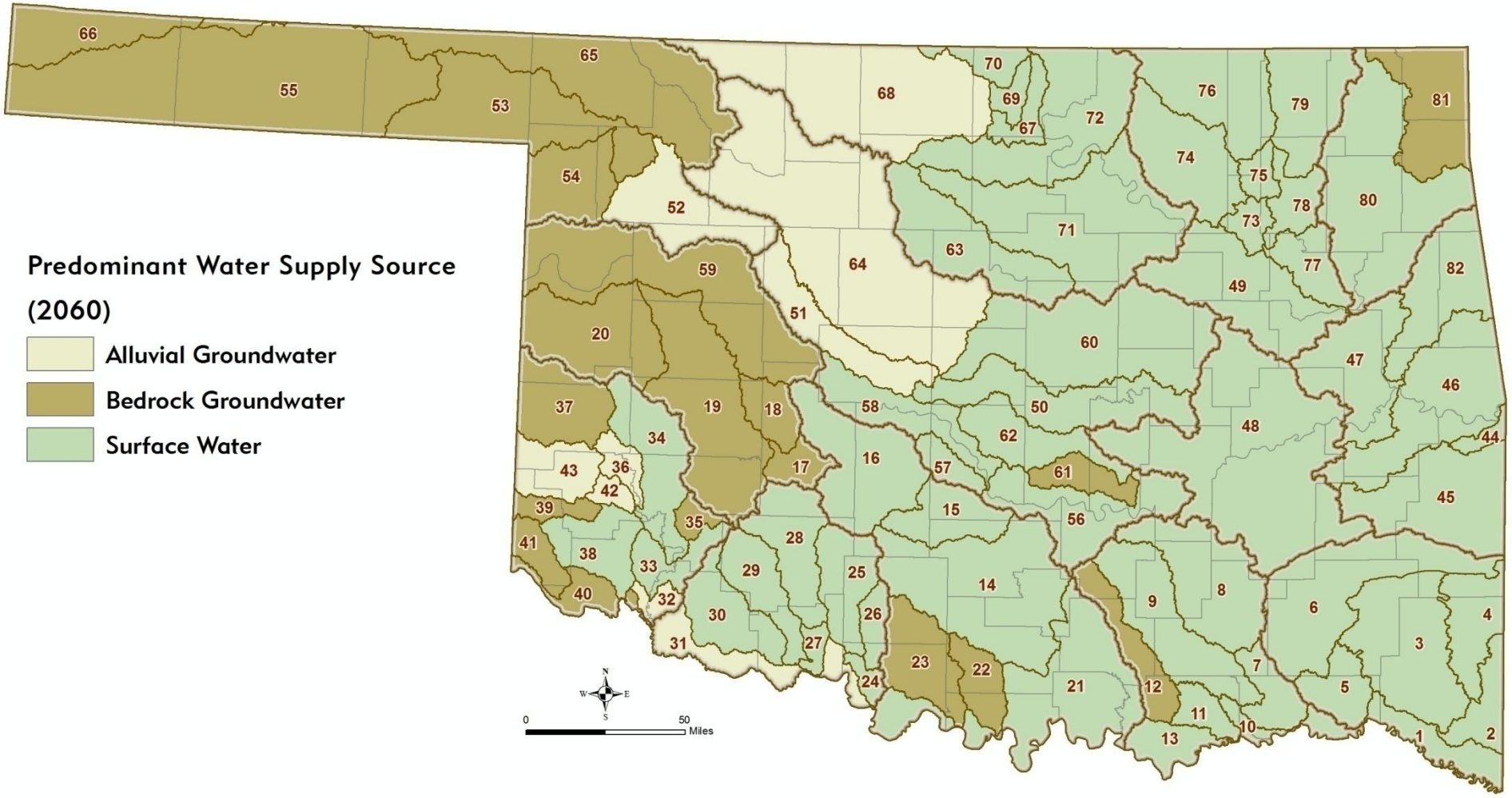
Presentation Overview

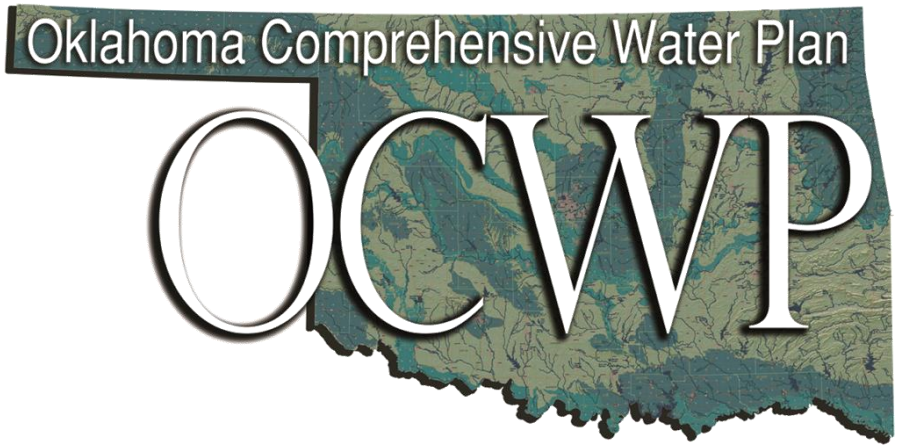
- Demand
- Hot Spots
- Water Supply Options
- Water Provider Resources

Statewide OCWP Watershed Planning Region and Basin Delineation



2060 Predominant Water Supply Source





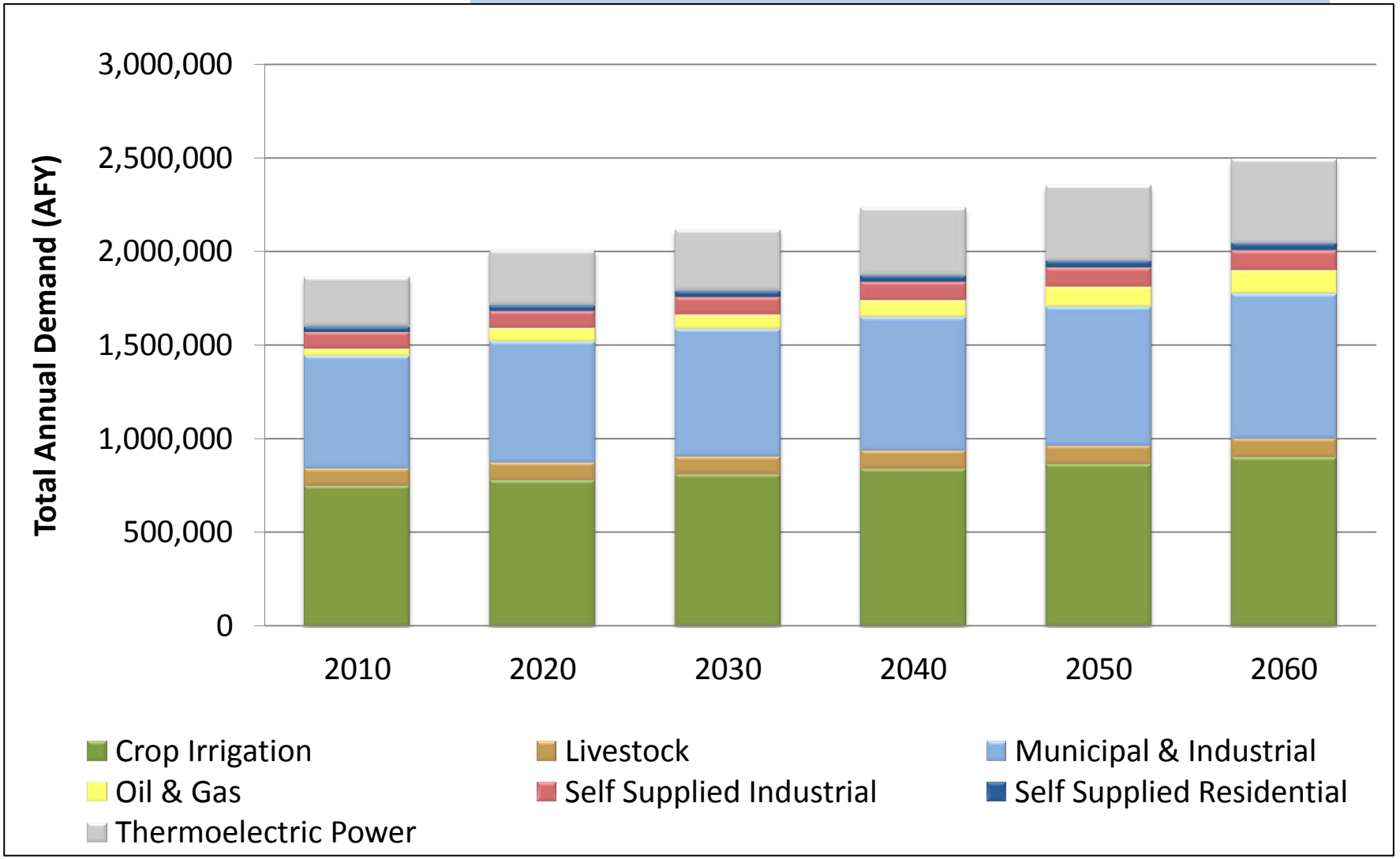
Presentation Overview

- **Demand**
- **Hot Spots**
- **Water Supply Options**
- **Water Provider Resources**

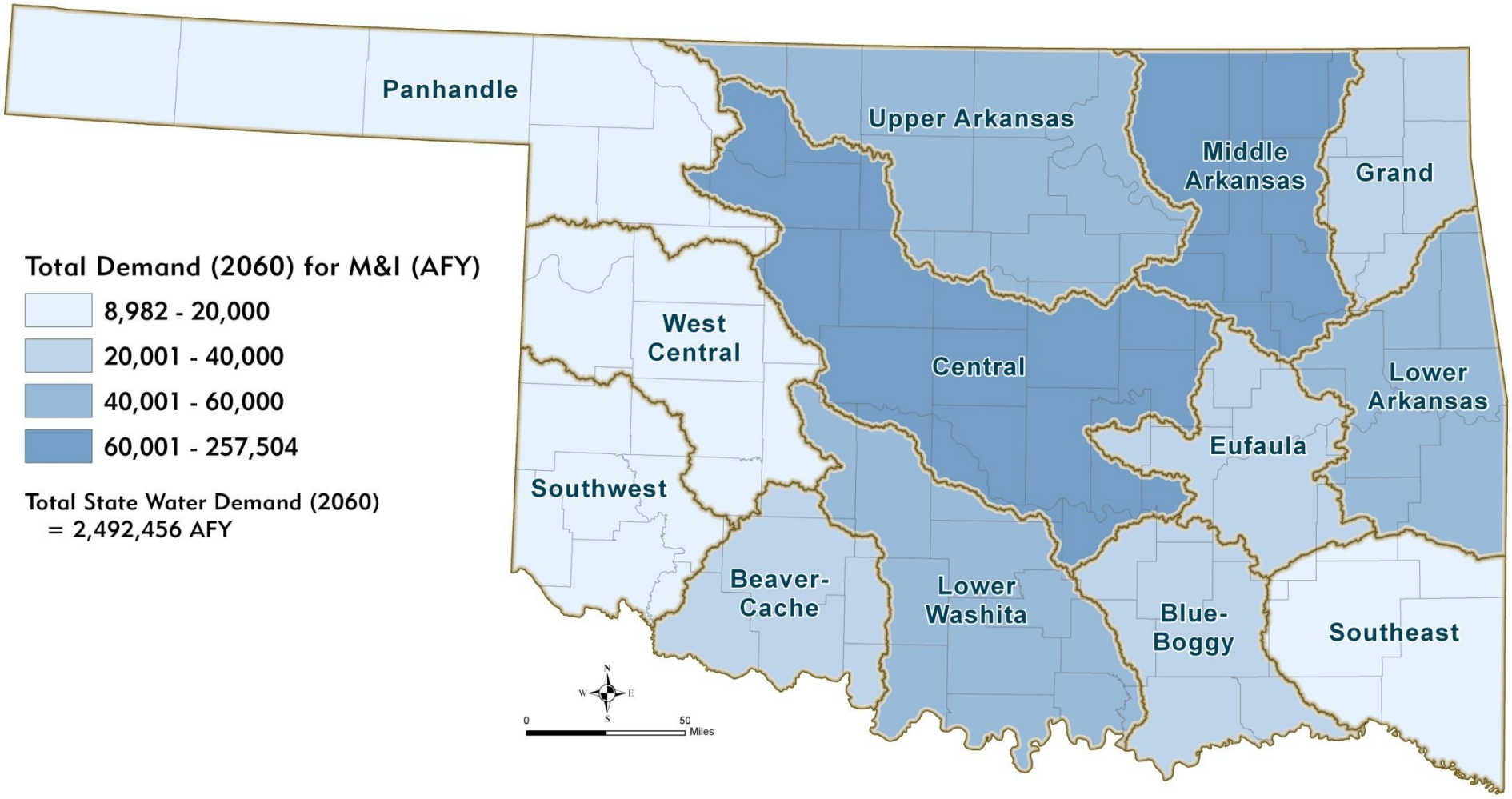
Calculating Demand

- Demand is calculated based on key driver for the sector
  - *People*
  - *Crop Acres*
- Uses best available rate of use for key driver
  - *Gallons per household*
  - *AF per irrigated acre*

Total Statewide Demand by Sector

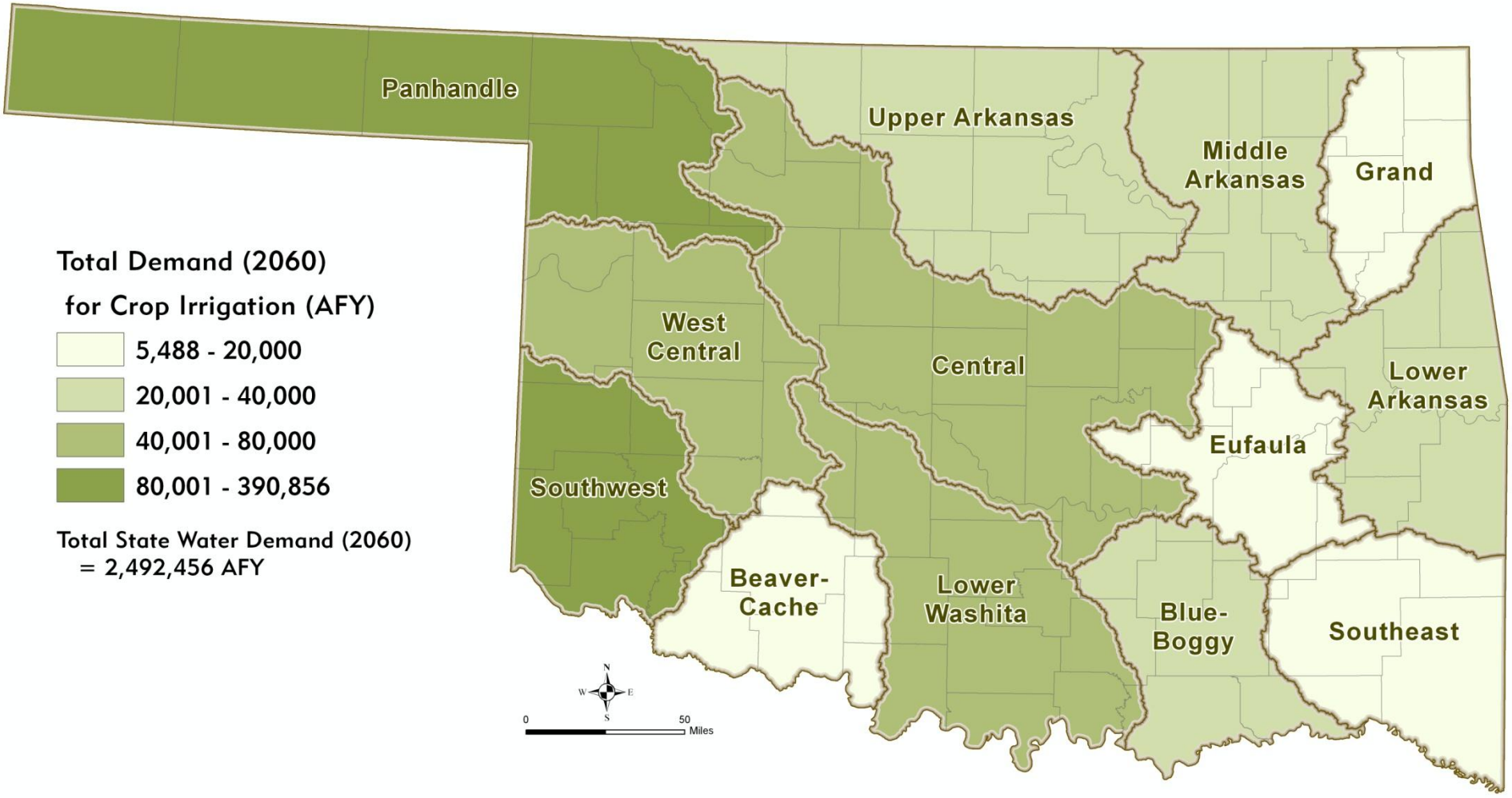


2060 Municipal & Industrial Water Demand by Region

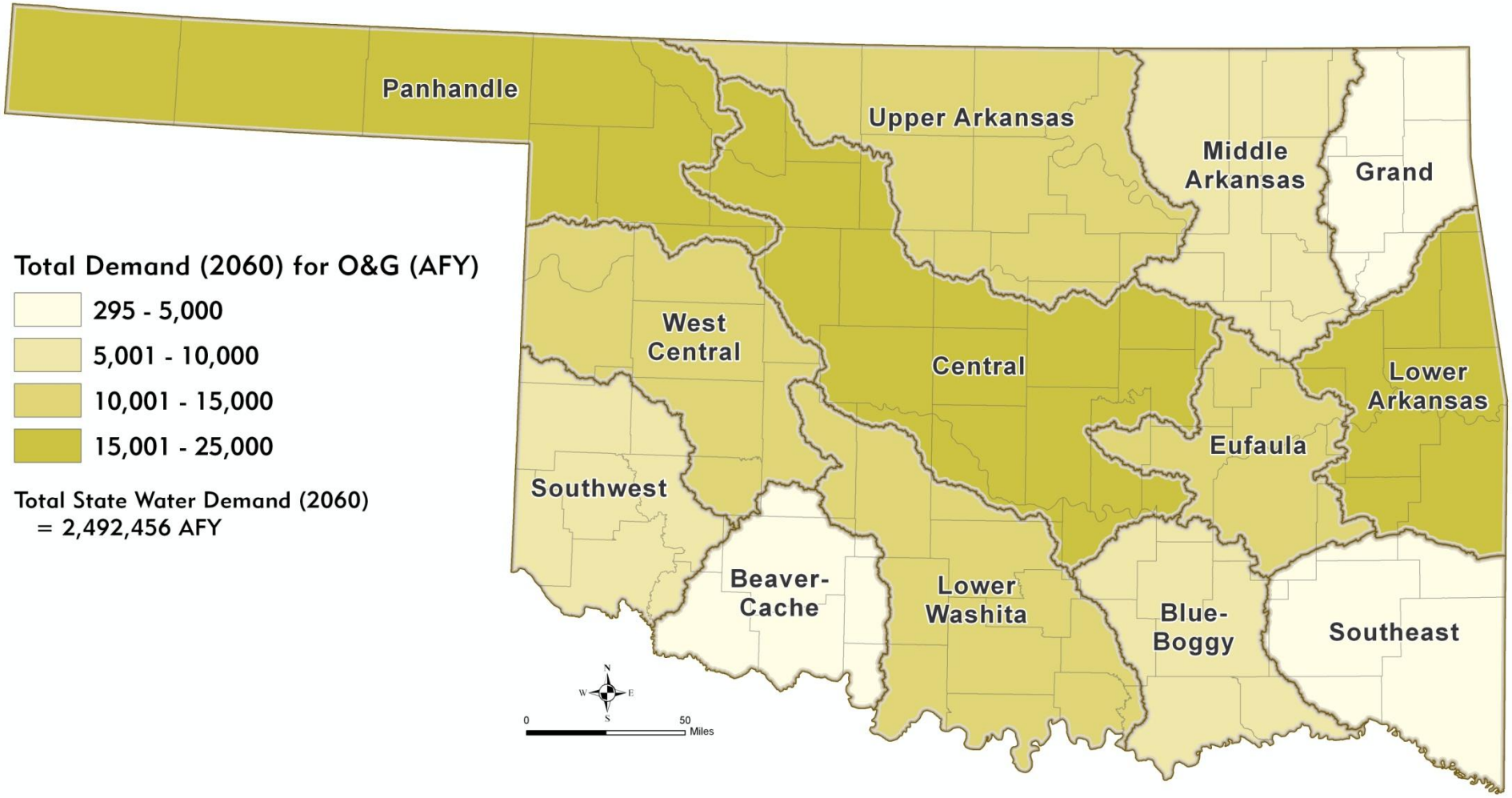


2060 Thermoelectric Power Water Demand by Region

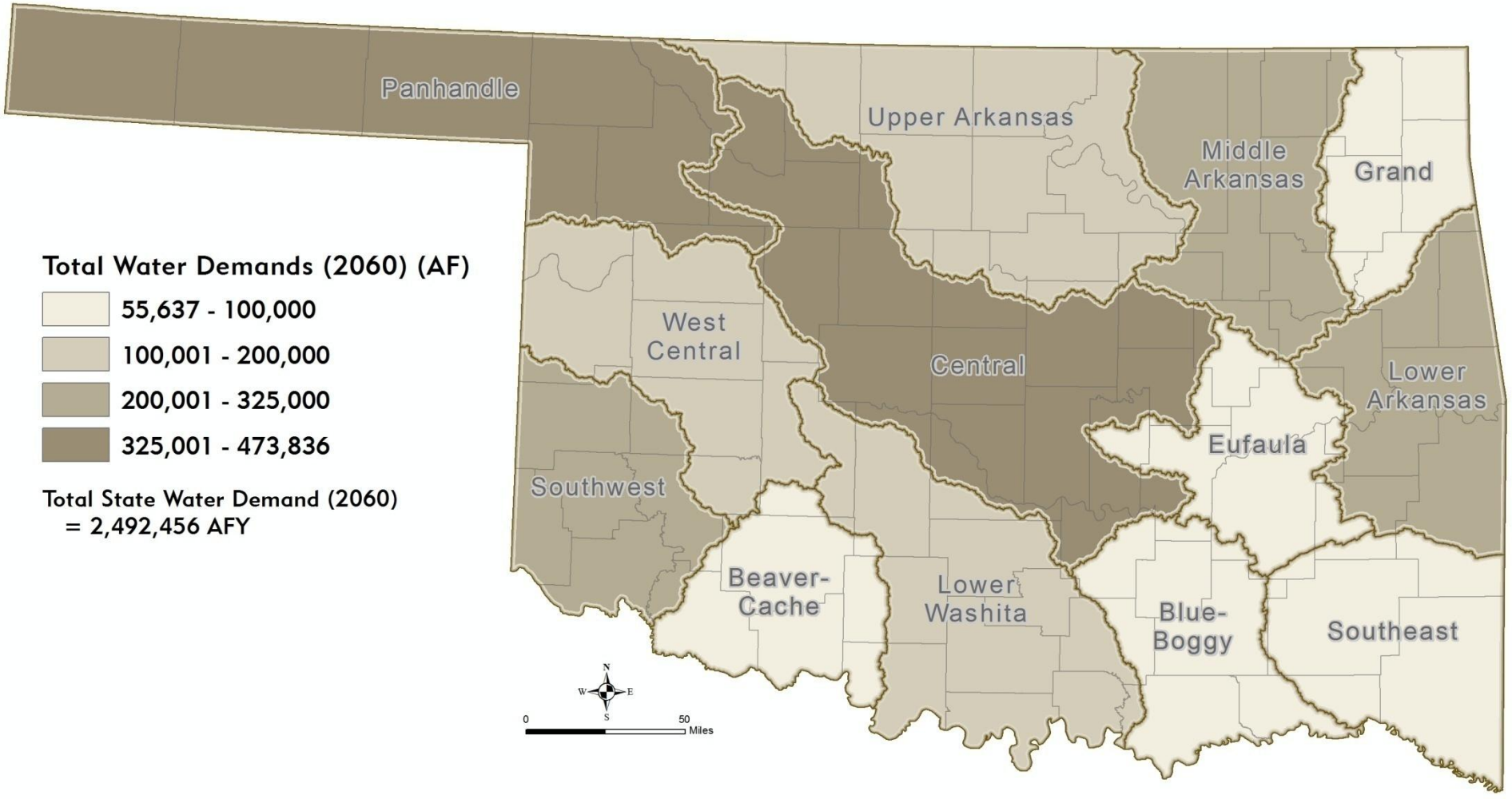
2060 Crop Irrigation Water Demand by Region



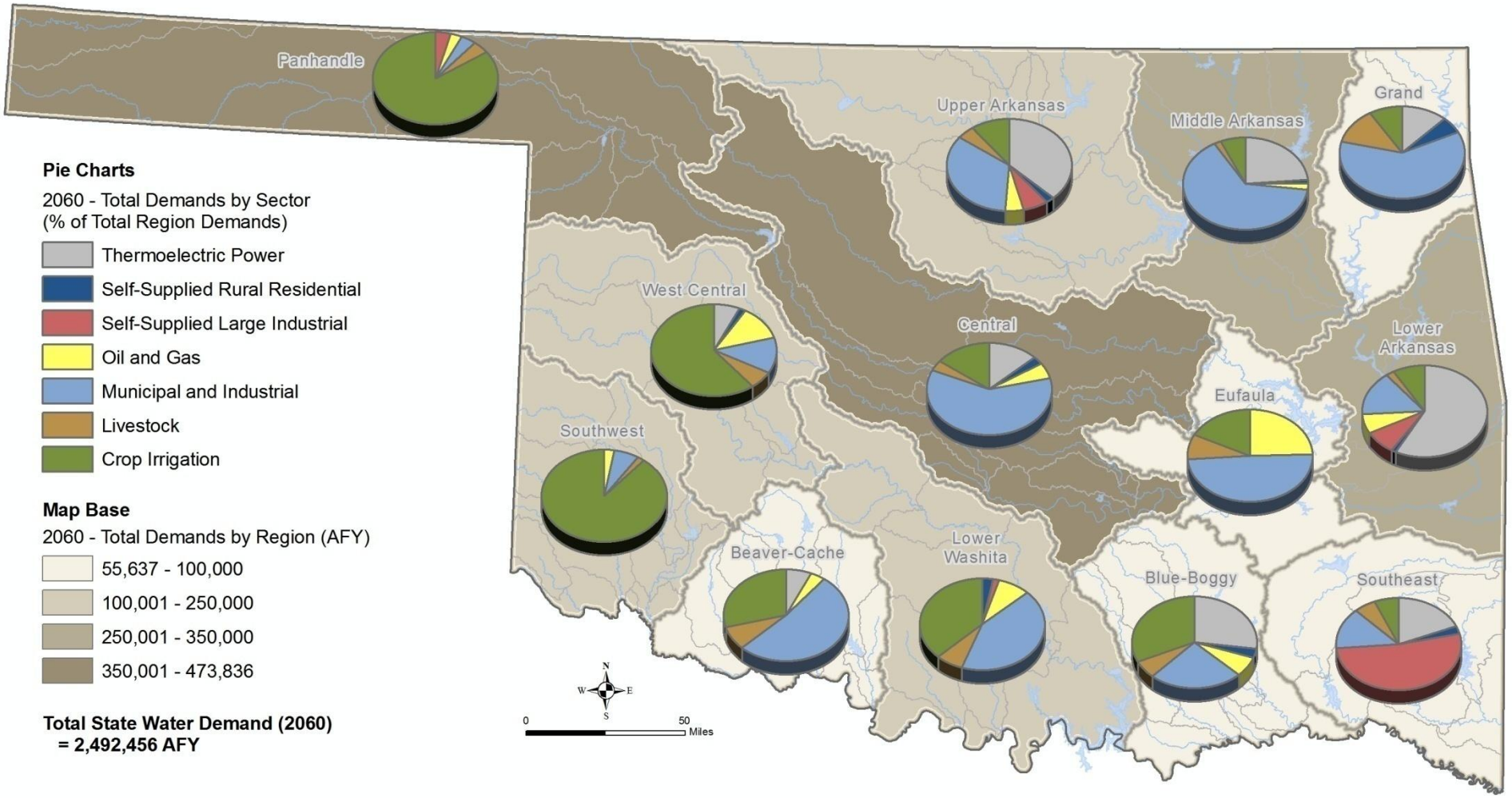
2060 Oil & Gas Water Demand by Region

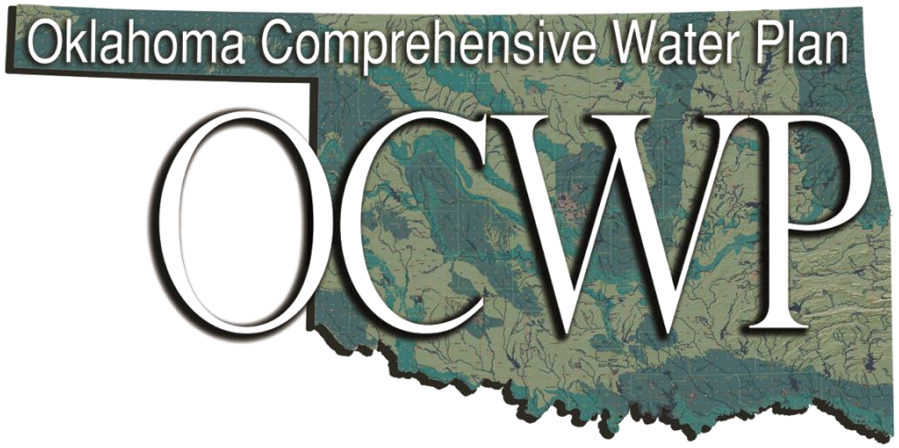


2060 Total Regional Water Demand by Region



2060 Total Regional Water Demand & Water Sector Demand Distribution





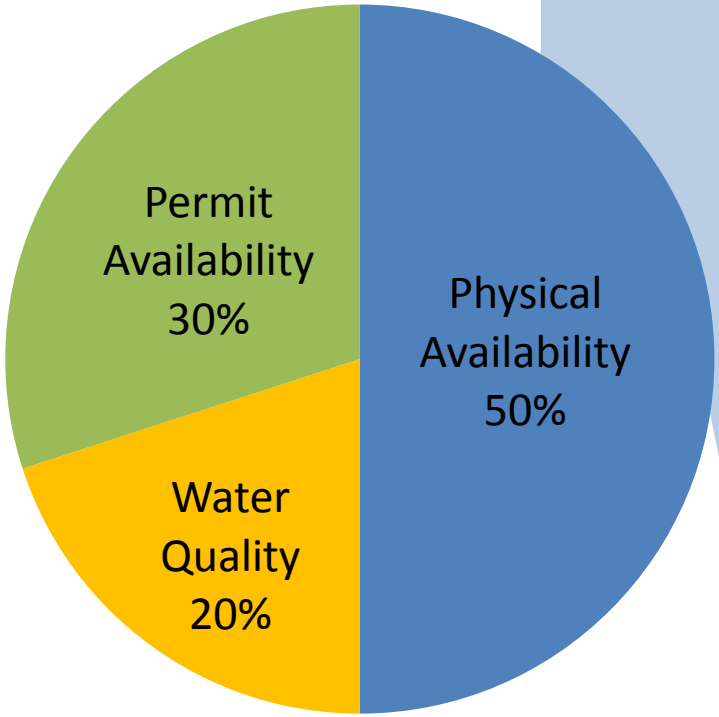
Presentation Overview

- Demand
- **Hot Spots**
- Water Supply Options
- Water Provider Resources

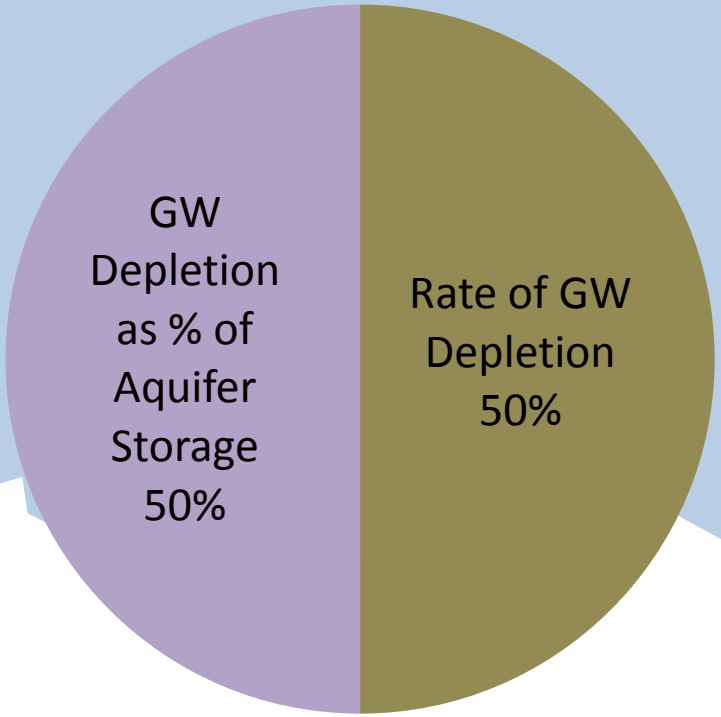
Planning for a Reliable Supply

Evaluation Criteria Based on Available Data and Criticality to Supply

Surface Water

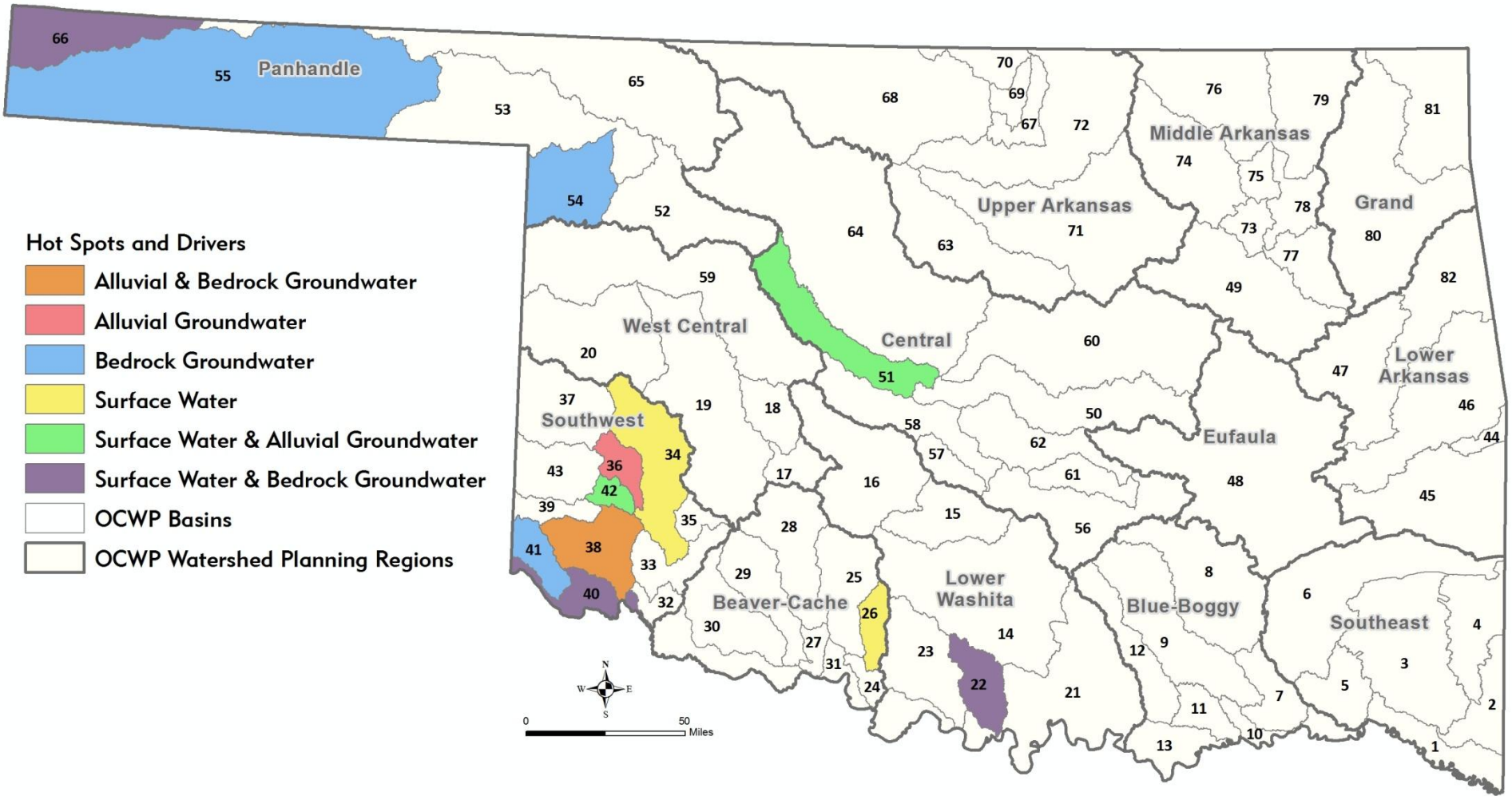


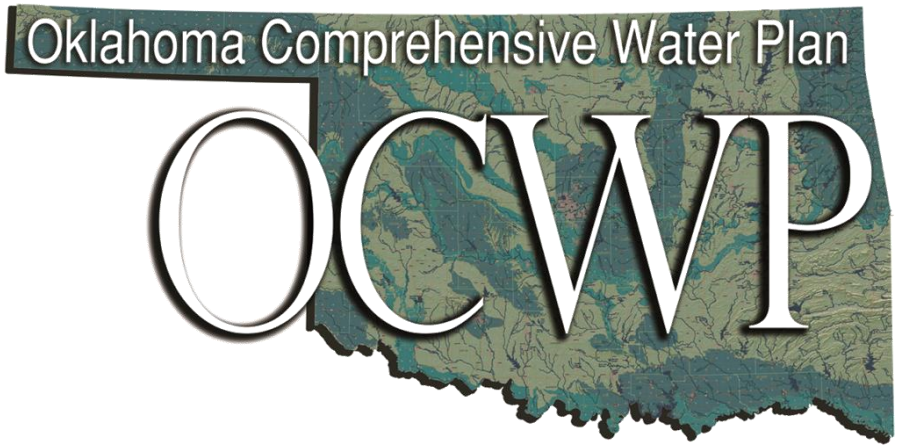
Groundwater



- Less robust statewide groundwater quality data
- No permitting constraints projected through 2060

Hot Spots


Hot Spots and Drivers
Alluvial & Bedrock Groundwater
Alluvial Groundwater
Bedrock Groundwater
Surface Water
Surface Water & Alluvial Groundwater
Surface Water & Bedrock Groundwater
OCWP Basins
OCWP Watershed Planning Regions
Panhandle
Middle Arkansas
Upper Arkansas
Grand
West Central
Central
Lower Arkansas
Southwest
Eufaula
Lower Washita
Beaver-Cache
Blue-Boggy
Southeast
N
W
E
S
0
50
Miles



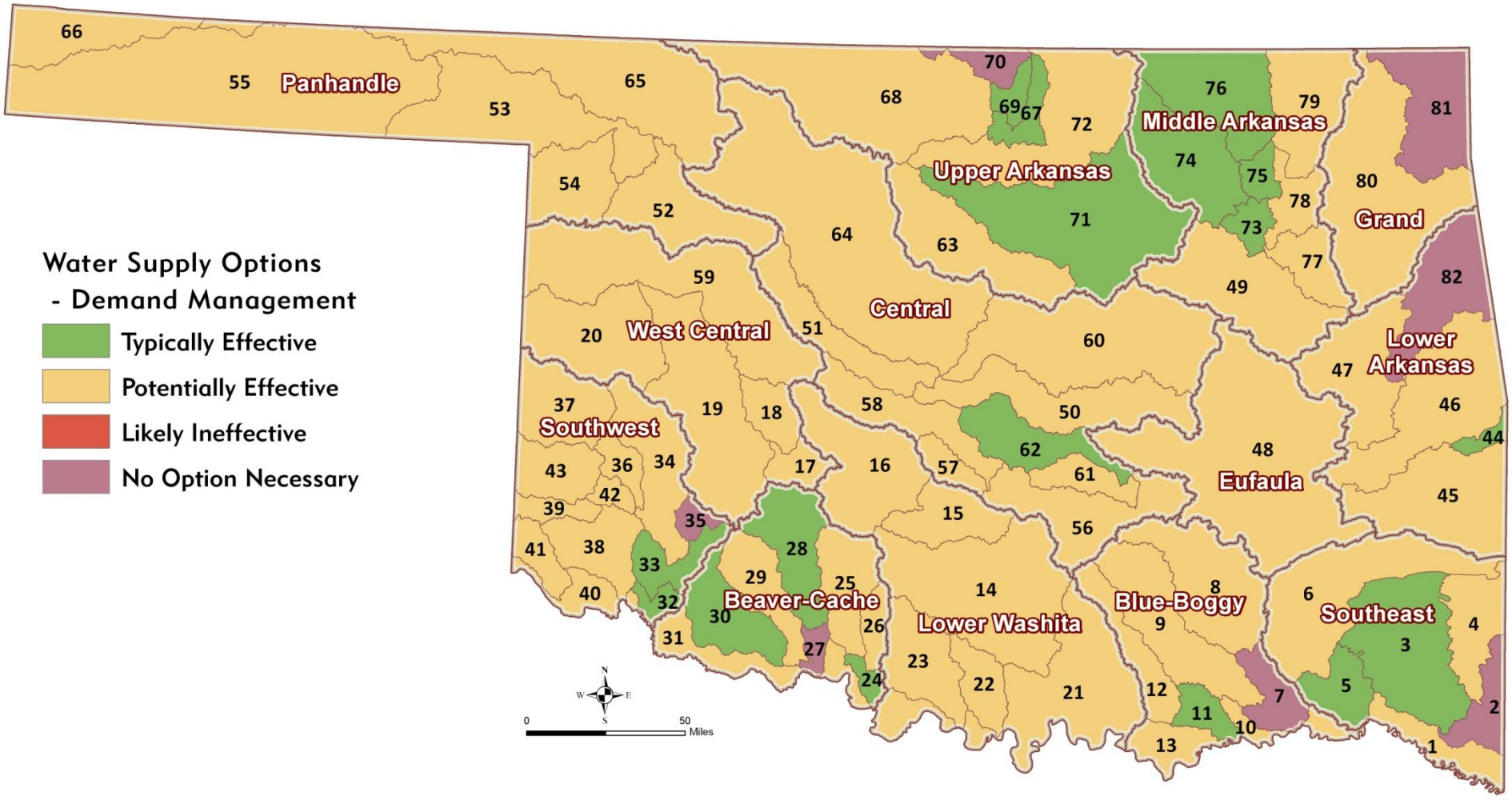
Presentation Overview

- Demand
- Hot Spots
- Water Supply Options
- Water Provider Resources

Water Supply Options

- Demand Management
- Reservoir Use
- Out-of-Basin Supplies
- Increasing Reliance on Surface Water
- Increasing Reliance on Groundwater
- Marginal Quality Water

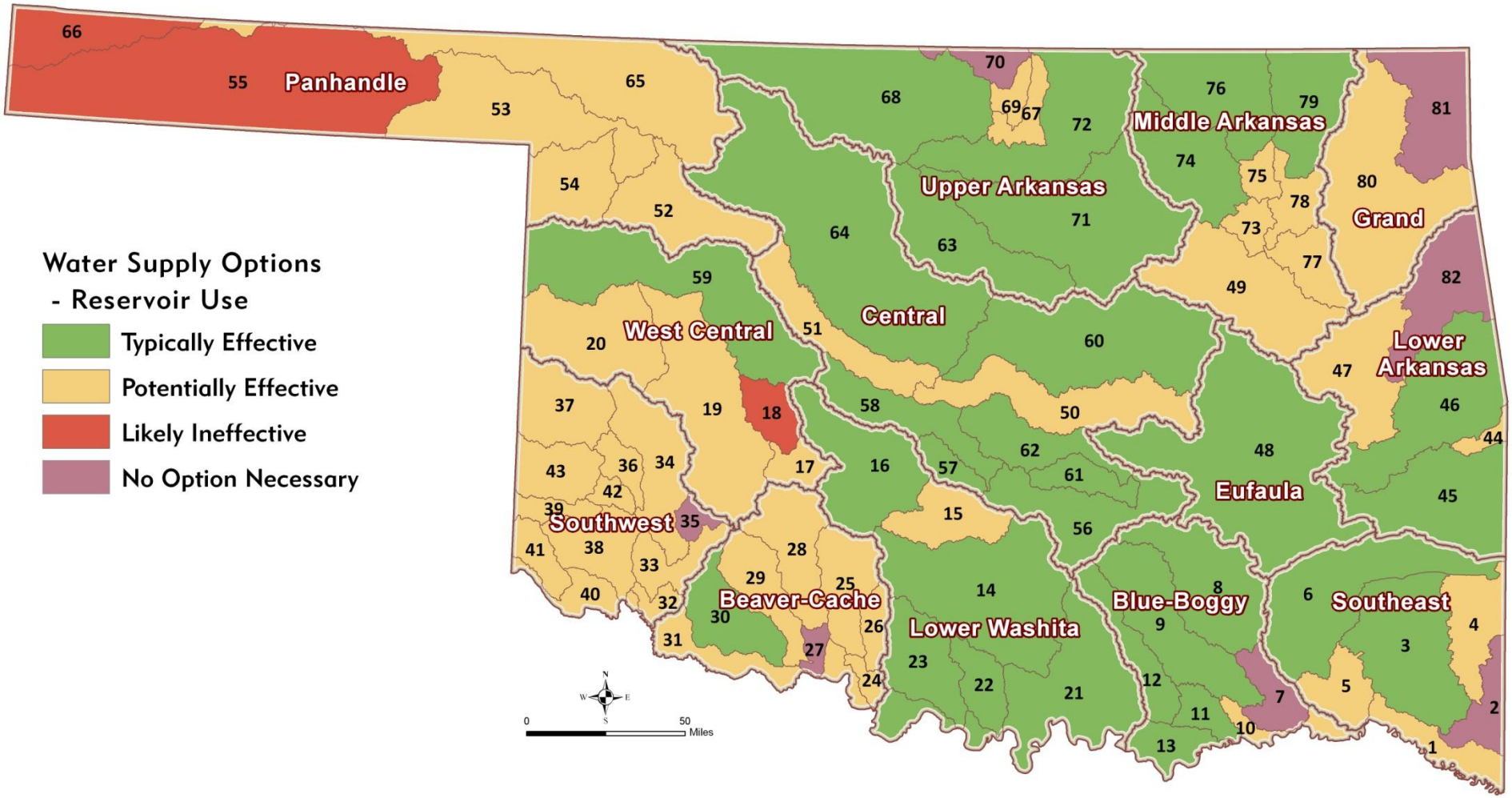
Basin Water Supply Options, Demand Management

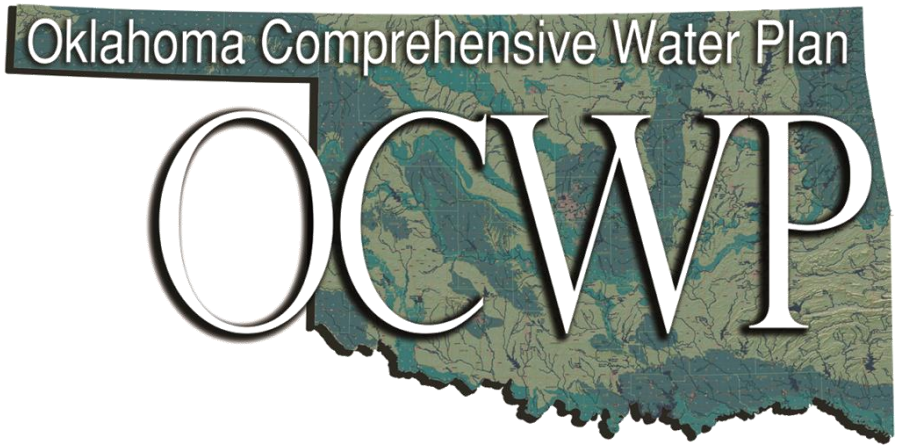


Conservation

- M&I Conservation
  - *Water Efficient Appliances*
  - *Education*
  - *Water System Improvements*
- Agricultural Conservation
  - *Increased Irrigation Efficiency*

Basin Water Supply Options, Reservoir Use





Presentation Overview

- Demand
- Hot Spots
- Water Supply Options
- Water Provider Resources

Public Water Provider Information

- Population
- Water use per person
- Calculation of water demand
- Wholesale transfers

Public Water Provider Demand Forecast (1 of 3)

Lower Arkansas Region

Provider	SDWIS ID[1]	County	Demand (AFY)					
			2010	2020	2030	2040	2050	2060
ADAIR CO RWD #1 (CHERRY TREE)	OK3000104	Adair	347	404	462	520	579	638
ADAIR CO RWD #2	OK3000105	Adair	157	183	209	236	262	289
ADAIR CO RWD #3	OK3000106	Adair	313	365	417	469	522	575
ADAIR CO RWD #4	OK3000107	Adair	97	101	116	130	145	160
ADAIR CO RWD #5	OK1021770	Adair	168	196	224	252	280	309

Public Water Provider Information

Wholesale Water Transfers (1 of 3)

Lower Arkansas Region)

Provider	SDWIS ID[1]	Sales			Purchases		
		Sells To	Emergency or Ongoing	Treated or Raw or Both	Purchases from	Emergency or Ongoing	Treated or Raw or Both
ADAIR CO RWD #1 (CHERRY TREE)	OK3000104				Stilwell	O	T
ADAIR CO RWD #2	OK3000105				Stilwell	O	T
ADAIR CO RWD #3	OK3000106				Stilwell	O	T
ADAIR CO RWD #4	OK3000107				Stilwell	O	T

OCWP Water Provider Survey

Lower Arkansas Region

Adair County RWD 1 (Cherry Tree)

Current Source of Supply

Primary sources: City of Stilwell

Short-Term Needs

Infrastructure improvements: refurbish standpipes; replace pump stations.

Long-Term Needs

Infrastructure improvements: replace distribution system lines; add a connection to Sequoyah County Water Association.

Adair County RWD 2

Current Source of Supply

Primary source: City of Stilwell

Short-Term Needs

Infrastructure improvements: replace storage tank.

Long-Term Needs

None identified.

Bokoshe PWA (LeFlore County)

Current Source of Supply

Primary source: Poteau Valley Improvement Authority

Short-Term Needs

None identified.

Long-Term Needs

None identified.

Braggs Water Works (Muskogee County)

Current Source of Supply

Short-Term Needs

None identified.

Long-Term Needs

New supply source: Possible water purchase from Tahlequah.

Cherokee Co RWD 3

Current Source of Supply

Primary source: City of Tahlequah, Seminary Springs

Short-Term Needs

Infrastructure improvements: replace main distribution system lines.

Long-Term Needs

Infrastructure improvements: replace water tower and booster pump station; increase water treatment capacity.

Tools Developed for the OCWP Update

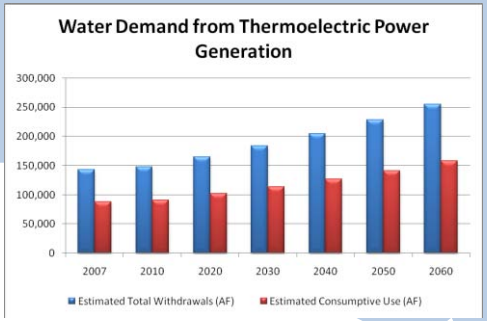
under USACE / OWRB authorities

Supply/Demand Gap Tool

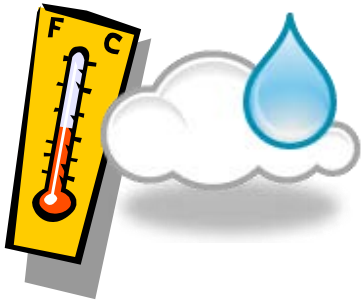
SWAM

Simplified Water Allocation Model

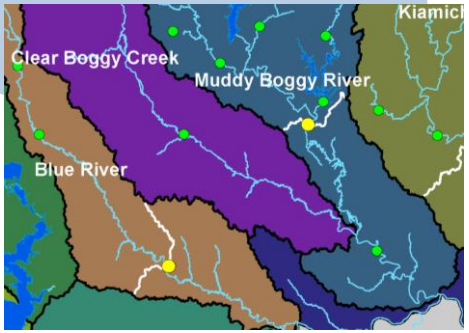
Reservoir Yield Model



Demand Projection Model



Climate Demand Model



Water Allocation Models

Public Water Supply Planning Guide

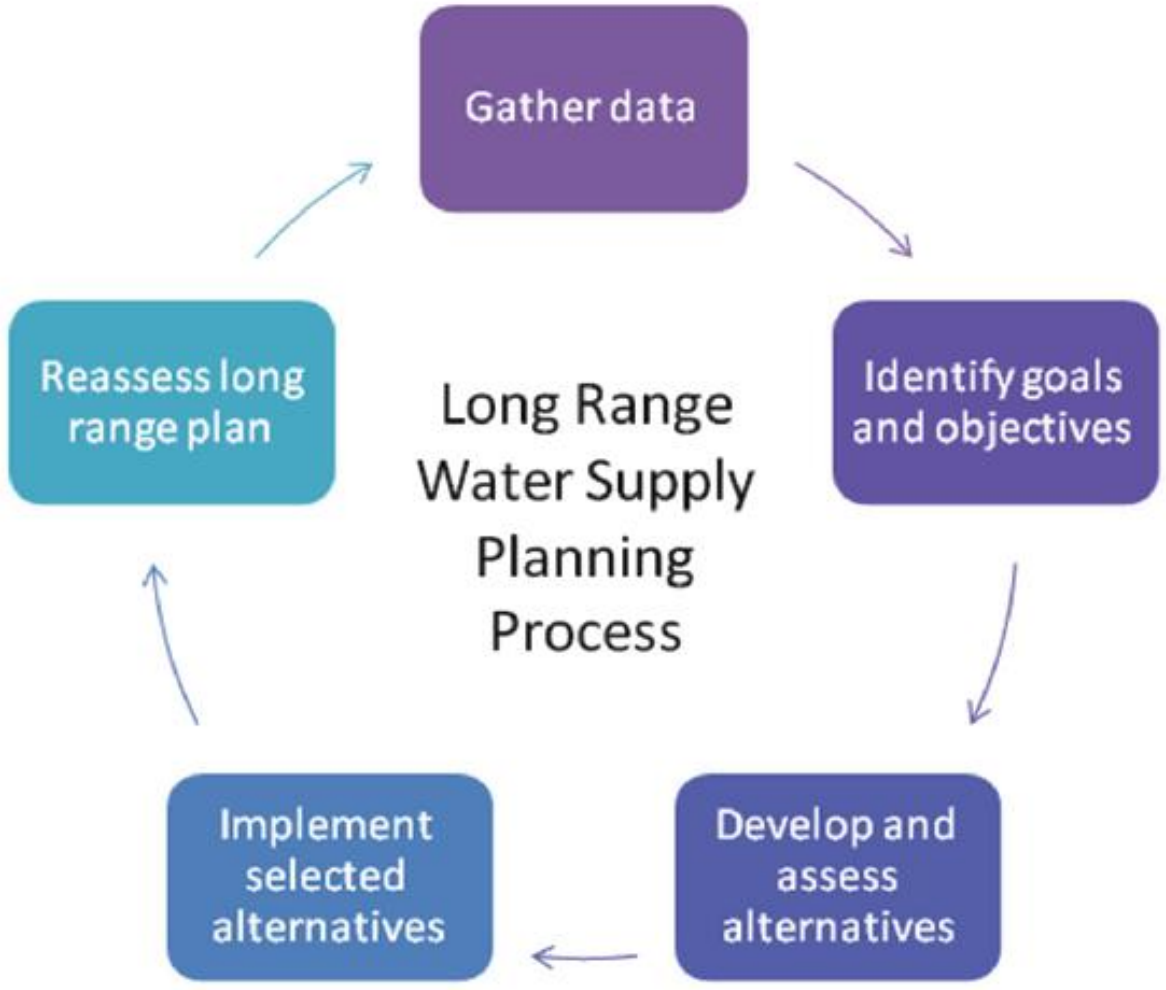


Figure 1-1 Strategic Planning Process

Framework for Long-term Water Supply Planning

- Targeted at small and medium sized public water providers
- Forms/tables to help gather and organize data
- Help defining objectives
- Industry standard calculations/methodology
- Help identifying and evaluating conceptual alternatives
- Brings information together needed for permits and loan applications

Forms to Develop Individual Plan

Table 3-3 Permits Actions Required

☐	Attached permits and/or identify physical and/or electronic location of document(s) here. Physical Location: _____ _____ Electronic Location: _____ _____
☐	Does the permit contain a schedule of use (reflects expected increase in water use)? _____ If so, list below. **Year** | **Permitted Use (AFY)** _____ | _____ _____ | _____ _____ | _____ _____ | _____ _____ | _____
☐	Included notes about source water availability based on experience: Experience related to changes in quantity (e.g., Has there been a period when you were unable to get enough source water): _____ _____ _____ Experience related to changes in water quality (e.g., How does quality change during hot, dry periods? How does quality change after large rainfall events?) _____ _____ _____ Have there been changes in the amount of water that you are purchasing from or selling to other providers? _____ Why? _____ _____ _____

Guidance and Example

Table B3.3 Permit(s)

Attached permits and/or identify physical and/or electronic location of document(s) here.

Physical Location: Permit is kept in filing cabinet.

Electronic Location: N/A

Does the permit contain a schedule of use (reflects expected increase in water use)? No.

If so, list below.

Year	Permitted Use (AF/Y)
N/A	550

Included notes about source water availability based on experience:

Experience related to changes in quantity (e.g., Has there been a period when you were unable to get enough source water): None known.

Experience related to changes in water quality (e.g., How does quality change during hot, dry periods? How does quality change after large rainfall events?) None known.

Have there been changes in the amount of water that you are purchasing from or selling to other providers? N/A Why? N/A

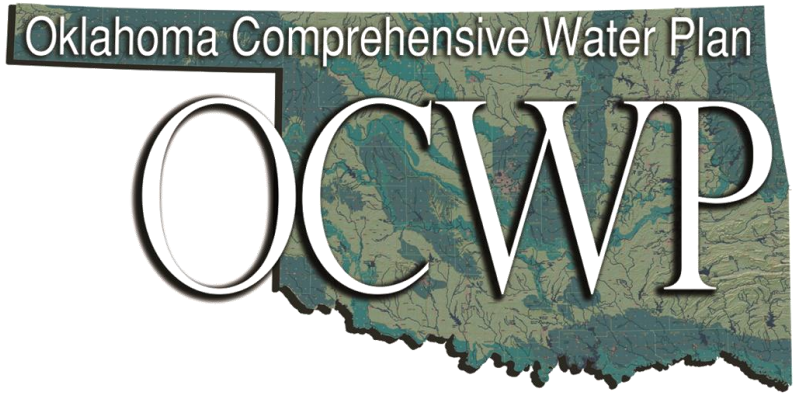
Have there been any changes in the watershed that have influenced water quality? No

If so, describe: N/A

Other notes: Historically, we have had higher levels of copper due to natural conditions.

Conclusion

- OCWP has developed demand estimates for seven sectors statewide.
- Twelve basins were identified as hot spots based on physical, permitting, and water quality criteria.
- Six water supply options were evaluated for the hot spots and other basins.
- Public water provider specific demands and water planning guide have been developed.



OCWP Technical Studies: Hot Spots and Water Supply Options

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