

Central Planning Region

Summary

- Central Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 115,803 acre-feet per year (36%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the Central Region basins except Basin 51. Permitting of surface water in portions or all of Basins 56, 57, and 58 is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Central Region stakeholders expressed the need to consider investing in regionalization, invasive species removal, and studies that support all water use and economic sectors.



OWRB Water
Planning Page

oklahoma.gov/owrb/water-planning

The Central Region represents **46%** of the state's **2075** projected population and **20%** of the state's total **2075** water demand projections.



Interactive maps can be viewed through the OCWP dashboards, accessible at oklahoma.gov/owrb/water-planning.

Reliable water supplies must be physically available (wet water available at the time and place it's needed), legally available (having a permit to use the water), of suitable quality for its intended purpose, and have the necessary infrastructure to divert, convey, and treat the water if necessary. For the Central Region, to mitigate projected water supply shortages, the following strategies will typically be most effective:

- Reduce water demand through conservation, water loss reduction, and other activities (PS, SSI, OG, TE). **WSS**
- Reduce water demand through agricultural water saving options (CI, LS). **WSS**
- Continue/increase reliance on in-basin surface water (all sectors) in some basins. **WSS** **WDI**
- Continue/increase reliance on in-basin groundwater (all sectors) in some basins. **WSS** **WDI**
- For basins where existing and traditional strategies are unable to meet future demands, stormwater capture and use (PS, SSI), water reuse (PS, SSI), and water transfers (all sectors) may be effective. **WM** **WSS**

Options to address water quality concerns include expanding source water protection programs and expanding water quality studies. **WSS** **WDI**

Infrastructure limitations can be addressed through additional water funding. Possible sources of new funding include providers setting appropriate water rates, public-private partnerships, state programs, and federal programs. **WIW**

Water Demand Sectors: PS = Public Supply, SSI = Self-supplied Industrial, OG = Oil & Gas, TE = Thermoelectric Power, CI = Crop Irrigation, LS = Livestock, SSD = Self-supplied Domestic

OCWP Statewide Recommendations: The recommendations are designed to address current and anticipated water supply challenges. Areas where the OCWP Statewide Recommendations specifically address this region's challenges are noted throughout this fact sheet with the following icons: **WIW** Water Infrastructure & Workforce, **WM** Water Management, **WSS** Water Supplies & Storage, and **WDI** Water Data & Information



OKLAHOMA
Water Resources Board

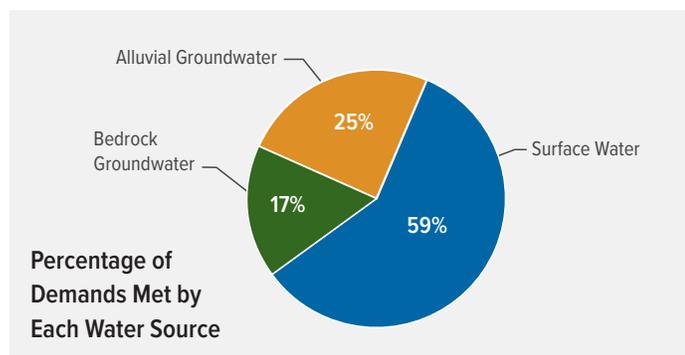
Population

2020	2030	2035	2045	2060	2075
1,537,408	1,628,904	1,62,995	1,801,176	2,014,743	2,198,527

Water Demand Projections

Water demands (withdrawals) are projected to increase by 36% between 2020 and 2075.

The Central Region’s largest demand sector is Public Supply, representing 64 percent of the region’s 2075 water demands. The second-largest demand sector is Crop Irrigation at 21 percent of the region’s 2075 water demands.



Water demand refers to the amount of water that needs to be withdrawn from surface waters and/or groundwater to meet the needs of people, communities, industry, agriculture, and other users. Changes in water demands correspond to growth or decline in population, agriculture, industry, or related economic activity. Demands were projected through 2075 for seven distinct consumptive water demand sectors.

In the Central Region, Self-supplied Domestic, Crop Irrigation, Public Supply, and Thermolectric Power demands will increase while Self-supplied Industrial and Livestock demands will decrease between now and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	16,990	17,844	18,228	19,109	20,682	22,080
Self-supplied Industrial	5,274	5,141	5,097	4,963	4,766	4,636
Crop Irrigation	61,551	74,339	76,676	81,330	86,928	92,537
Livestock	12,814	12,577	12,595	12,404	12,144	11,966
Oil & Gas	16,341	16,341	16,341	16,341	16,341	16,341
Public Supply	196,035	207,982	214,691	229,035	254,387	276,483
Thermolectric Power	8,614	5,853	5,552	7,150	8,342	9,379
Total	317,619	340,077	349,181	370,332	403,592	433,422

AFY = acre-feet per year; Small differences may result due to rounding.

Physical Water Shortages WIW WM WSS

To quantify physical surface water gaps and groundwater storage depletions through 2075, use of existing surface water and groundwater supplies was assumed to continue in current proportions while out-of-basin supplies will be used up to permit amounts or projected demands, whichever is less.

The Central Region is projected to experience surface water gaps (where demand exceeds supplies) and groundwater depletions (where water use exceeds the rate of recharge), as detailed in the tables below. The magnitude of shortages is projected for all planning years, and the frequency (probability) of a shortage occurring is estimated for 2075 demand conditions. Bedrock groundwater frequencies are constant because of the lack of direct connection to surface water hydrology. Frequent shortages with large magnitudes are indicative of the greatest need to implement alternative water management strategies.

SURFACE WATER GAP	2030	2035	2045	2060	2075	2075
	Magnitude (AFY)					Frequency
50	1,060	1,728	3,133	5,681	11,377	83%
51	157	241	414	655	834	83%
56	134	175	306	272	270	25%
57	110	109	109	108	109	28%
58	49	92	197	441	689	97%
60	996	1,641	3,015	5,503	8,015	85%
61	3	4	6	11	15	17%
62	232	381	705	1,409	2,394	83%
64	393	684	1,422	2,782	4,590	89%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
	Magnitude (AFY)					Frequency
50	10	15	98	183	312	14%
51	1,120	1,768	3,089	5,179	6,959	92%
56	369	495	799	827	852	23%
57	7	9	20	38	60	35%
58	1	3	178	493	774	15%
60	-	-	-	-	-	No AGW Demand
61	-	-	-	-	-	No AGW Demand
62	-	-	-	-	-	No AGW Demand
64	5,966	6,926	8,800	11,482	14,248	34%

AFY = acre-feet per year

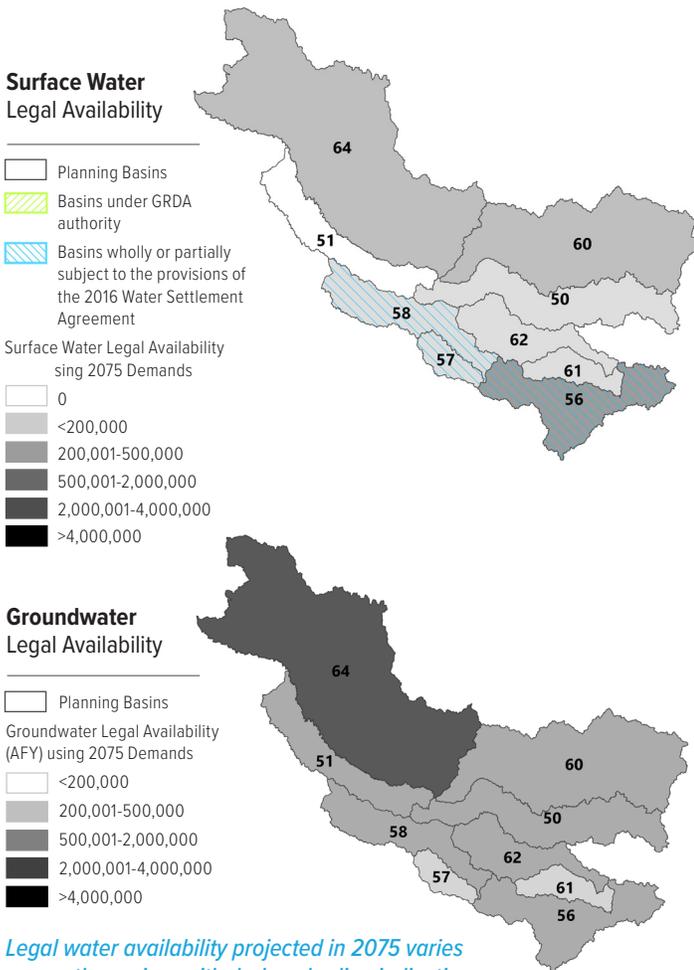
Physical Water Shortages Cont.

Basin	BEDROCK GROUNDWATER DEPLETION				
	2030	2035	2045	2060	2075
50	-	-	-	-	126
51	1,314	1,426	1,668	2,058	2,390
56	-	-	-	-	4
57	1,432	1,439	1,465	1,510	1,564
58	521	578	779	1,264	1,735
60	-	-	-	-	72
61	4	4	4	4	12
62	-	-	-	-	71
64	3,106	3,277	3,632	4,196	4,864

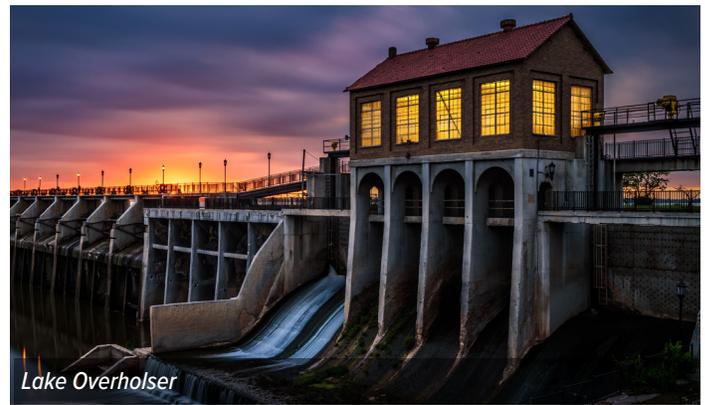
AFY = acre-feet per year

Legal Water Availability WM WSS

Surface water is projected to remain legally available for permitting through 2075 in all of the basins within the Central Region except Basin 51. Groundwater is legally available for permitting in all of the Central Region basins. Permitting of surface water in portions or all of Basins 56, 57, and 58 is subject to provisions of the 2016 Water Settlement Agreement.



Legal water availability projected in 2075 varies across the region, with darker shading indicating more water available for appropriation.



Surface Water Resources

WIW WM WSS WDI

The OCWP uses historical monthly streamflow data (1950-2021), which reflects current natural and human-created conditions (runoff, diversions and use of water, and impoundments and reservoirs) to represent the water that may be physically available to meet projected demand. The maximum amount of water a reservoir can dependably supply during a critical drought period is referred to as its yield. The table below provides information about remaining water supply yield that is available for permitting from existing reservoirs in the region.

Reservoir	Estimated Remaining Water Supply Yield to be Permitted (AFY)
Shawnee Twin Lakes	0
Tecumseh	---
Wes Watkins	---
Wetumka	---
El Reno	---
Overholser	0
Holdenville	---
Konawa	---
Purcell	---
Arcadia	0
Bell Cow	414
Chandler	---
Meeker	0
Prague City	0
Sparks Lake	0
Stroud	199
Stanley Draper	---
Thunderbird	0
Guthrie	---
Hefner	---
Liberty	---

--- Indicates no information is available.
 AFY = acre-feet per year
 Estimated remaining water supply yield as of July 2025.

Groundwater Resources

WIW WM WSS WDI

For the OCWP physical water availability analyses, alluvial aquifers are defined as aquifers comprised of river alluvium and terrace deposits, occurring along rivers and streams and consisting of unconsolidated deposits of sand, silt, and clay. Alluvial aquifers are more hydrologically connected with surface water features (streams, rivers, lakes) than bedrock aquifers. Bedrock aquifers consist of consolidated (solid) or partially consolidated rocks, such as sandstone, limestone, dolomite, and gypsum. Bedrock aquifers are typically replenished slowly by recharge from surface infiltration (precipitation) and from adjacent aquifers.

Aquifer	Type	Class	Equal Proportionate Share (AFY/Acre)
Arbuckle-Simpson	Bedrock	Major	0.2
Canadian River	Alluvial	Major	temporary 2.0
Cimarron River	Alluvial	Major	temporary 2.0
East-Central Oklahoma	Bedrock	Minor	temporary 2.0
El Reno	Bedrock	Minor	temporary 2.0
Enid Isolated Terrace	Alluvial	Major	0.5
Fairview Isolated Terrace	Alluvial	Minor	temporary 2.0
Garber-Wellington	Bedrock	Major	2.0
Gerty Sand	Alluvial	Major	0.65
Isabella Isolated Terrace	Alluvial	Minor	temporary 2.0
Loyal Isolated Terrace	Alluvial	Minor	temporary 2.0
North Canadian River	Alluvial	Major	1.0
North-Central Oklahoma	Bedrock	Minor	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Vamoosa-Ada	Bedrock	Major	2.0

AFY = acre-feet per year

Bedrock aquifers with typical yields greater than 50 gallons per minute (gpm) and alluvial aquifers with typical yields greater than 150 gpm are considered major aquifers.

Water Quality

WIW WDI



Groundwater: Groundwater from major aquifers such as the Garber-Wellington and Ada-Vamoosa experiences shallow nitrate and salinity concerns, with deeper heavy metal concentrations.



Lakes: Water quality in this region is impacted by elevated levels of nutrients, chlorophyll-a, and turbidity—factors that directly affect both recreational and water supply uses. Lakes in this area are classified as eutrophic approaching hypereutrophic, reflecting their high nutrient concentrations and biological productivity.



Streams: Rivers and streams are impacted by urbanization, modification/impoundment, flow alteration, and agricultural runoff, leading to riparian loss, increased sedimentation, and increased nutrient concentrations. These factors contribute to poor aesthetics, habitat degradation, increased treatment costs, and increased flooding risk.

Water Infrastructure Needs

WIW

OWRB compiled near-term wastewater project needs, water supply project needs, and state flood plan project needs as part of developing the 2025 OCWP. Near-term costs include drinking water and wastewater projects by public utilities (various system sizes) and other entities (such as conservancy districts, department of wildlife, regional councils, and tourism). All flood mitigation projects in the database were identified by public water suppliers in the State Flood Plan.

Near-term Drinking Water Cost (2024 dollars)	Near-term Wastewater Cost (2024 dollars)	Near-term Stormwater Cost (2024 dollars)
\$5.28B	\$1.1B	\$152M

M = million

For drinking water, costs were projected for the next 20 years for public suppliers. While it is difficult to anticipate all the changes that may occur within this extended timeframe, it is beneficial to evaluate the order of magnitude of the long-range potential costs of meeting demands. Estimated costs include rehabilitation of existing water infrastructure and construction of new water infrastructure for growth and regulatory compliance. The costs are categorized according to system sizes:

- Small systems serve less than 3,300 people;
- Small-medium systems serve 3,301 to 10,000 people;
- Medium-large systems serve 10,001-100,000 people; and
- Large systems serve more than 100,000 people.

System Size	Near-term Drinking Water Cost (2024 dollars)	Future Drinking Water Costs through 2035 (2025 dollars) ¹	Future Drinking Water Costs through 2045 (2025 dollars) ²
Small	\$115M	\$4.12B	\$2.88B
Small-Medium	\$365M	\$785M	\$42.6B
Medium-Large	\$1.75B	\$950M	\$4.54B
Large	\$2.62B	\$850M	\$23.3B
Non-Public suppliers	\$434M	N/A	N/A
Total	\$5.28B	\$9.69B	\$73.3B

M = million; B = billion; N/A = not applicable

1. Not inclusive of near-term costs.

2. Not inclusive of near-term or future drinking water costs through 2035.

Visit OWRB Water Planning page (<https://oklahoma.gov/owrb/water-planning.html>) for more information on region water quality and trend analysis.