Blue-Boggy Planning Region

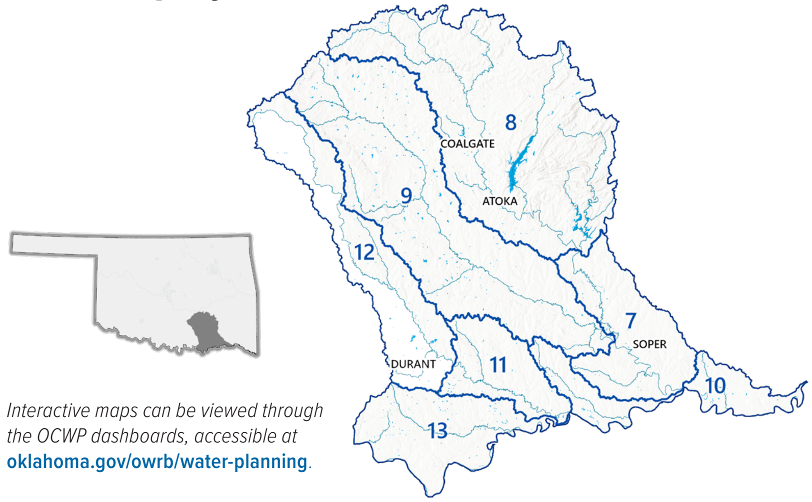
Summary

- Blue-Boggy Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 13,836 acre-feet per year (38%) 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 Blue-Boggy Region basins. Permitting of surface water in portions or all of the Blue-Boggy Region basins is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Blue-Boggy Region stakeholders expressed the need to consider instream flow (nonconsumptive use), additional demand/supply studies for rapid growth areas, and conjunctive management.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Blue-Boggy Region represents 2% of the state's 2075 projected population and 2% 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 Blue-Boggy 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 some basins where existing and traditional strategies are unable to meet future demands, 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

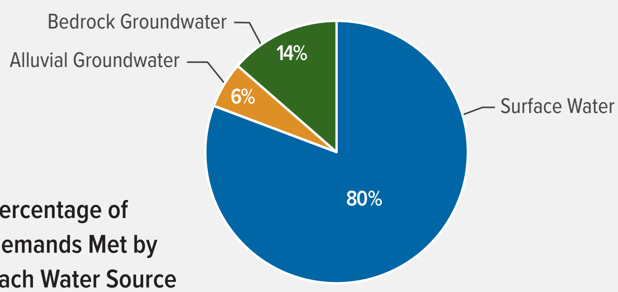
Population

2020	2030	2035	2045	2060	2075
98,821	103,190	103,741	105,994	111,264	115,444

Water Demand Projections

Water demands (withdrawals) are projected to increase by 38% between 2020 and 2075.

The Blue-Boggy Region's largest demand sector is Crop Irrigation, representing 51% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 29% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Blue-Boggy Region, Self-supplied Domestic, Crop Irrigation, Public Supply, and Thermoelectric Power demands will increase, while Self-supplied Industrial and Livestock demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,011	1,066	1,075	1,104	1,168	1,221
Self-supplied Industrial	126	123	119	113	104	94
Crop Irrigation	15,874	19,445	20,771	23,429	25,098	25,953
Livestock	4,272	4,171	4,173	4,089	3,976	3,890
Oil & Gas	1,126	1,126	1,126	1,126	1,126	1,126
Public Supply	11,070	11,874	12,104	12,675	13,757	14,726
Thermoelectric Power	3,392	2,304	2,186	2,817	3,287	3,696
Total	**36,870**	**40,109**	**41,553**	**45,352**	**48,516**	**50,706**

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 Blue-Boggy 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
7	9	26	59	119	158	4%
8	47	2	160	269	378	10%
9	312	318	328	354	395	15%
10	-	2	7	107	265	3%
11	-	-	-	-	-	0%
12	-	31	99	247	667	6%
13	-	-	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
7	-	1	1	2	3	4%
8	-	-	3	3	3	10%
9	-	-	-	-	-	No AGW Demand
10	-	-	-	-	-	0%
11	-	-	-	-	-	No AGW Demand
12	-	-	-	-	-	No AGW Demand
13	-	-	-	-	-	0%

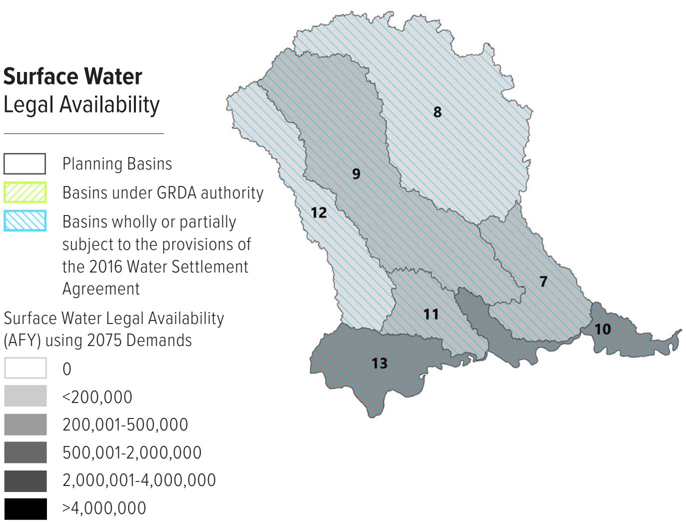
AFY = acre-feet per year

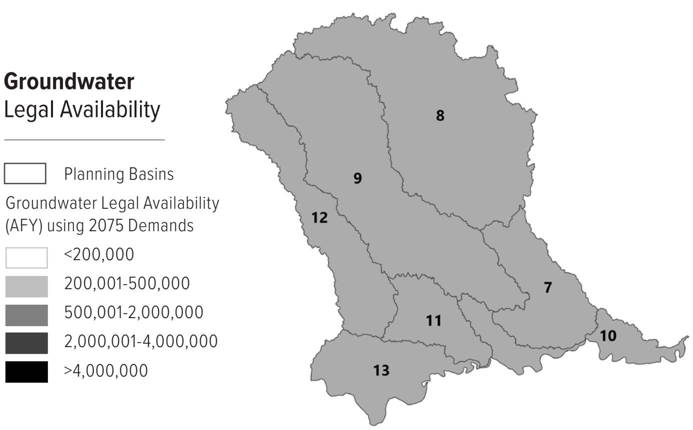
BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
7	1	1	-	-	-
8	3	3	1	-	-
9	13	13	13	12	11
10	3	2	2	2	3
11	2	2	2	2	2
12	12	12	12	12	13
13	74	108	176	207	209

AFY = acre-feet per year

Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Blue-Boggy Region. Permitting of surface water in portions or all of Blue-Boggy Region basins 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)
Albany Lake	0
Atoka	0
Coalgate	No Known Yield
McGee Creek	7,192

--- 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)
Antlers	Bedrock	Major	2.1
Arbuckle-Simpson	Bedrock	Major	0.2
Ashland Isolated Terrace	Alluvial	Minor	temporary 2.0
East-Central Oklahoma	Bedrock	Minor	temporary 2.0
Kiamichi	Bedrock	Minor	temporary 2.0
Pennsylvanian	Bedrock	Minor	temporary 2.0
Red River Reach 3	Alluvium and Terrace	Major	temporary 2.0
Red River Reach 4	Alluvium and Terrace	Major	temporary 2.0
Woodbine	Bedrock	Minor	temporary 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 the major aquifers such as the Arbuckle-Simpson, Antlers, and Red River shows water quality concerns over nitrate, total dissolved solids, and salinity concentrations. The lack of seasonal data, especially in sensitive karst systems, makes it difficult to track changes in water quality over time.

Groundwater from the major aquifers such as the Arbuckle-Simpson, Antlers, and Red River experiences elevated nitrate, total dissolved solids, and salinity levels.

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 mesotrophic to eutrophic, reflecting their moderate to high nutrient concentrations and biological productivity.

Streams: Rivers and streams are impacted by flow alteration, sedimentation, and riparian loss concerns. These factors contribute to poor aesthetics, habitat degradation, and increased treatment costs.

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)
$436M	**$392M**	**$0M**

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	$52M	$1.59B	$285M
Small-Medium	$47M	$3M	$443M
Medium-Large	$0M	$161M	$133M
Large	N/A	N/A	N/A
Non-Public suppliers	$336M	N/A	N/A
Total	**$436M**	**$1.76B**	**$861M**

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.