Southwest
Planning Region

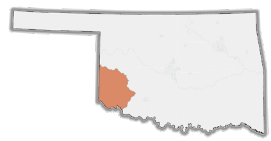
Summary

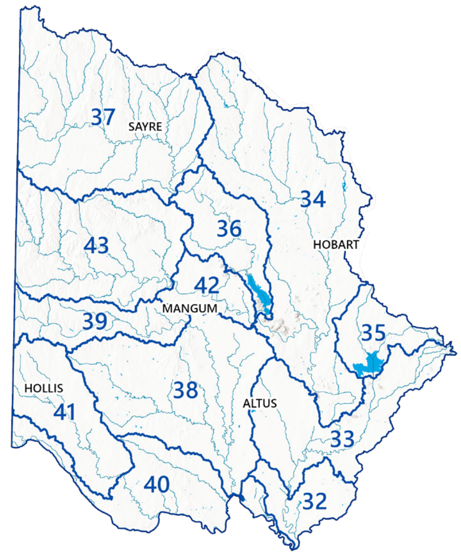
- Southwest Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,698 acre-feet per year (1%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water is projected to remain legally available for permitting through 2075 in all of the Southwest Region basins except Basin 36. Groundwater is legally available for permitting in all Southwest Region basins.
- In addition to the Statewide Recommendations, Southwest Region stakeholders expressed the need to consider conjunctive water management, reforming crop insurance, investing in irrigation districts, metering for all water uses, incentivizing removal of invasive species, supporting regionalization, expanding the Master Irrigators program and developing broader education program about best production/ irrigation practices.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Southwest Region represents 1% of the state's 2075 projected population and 11% 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 Southwest 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) for some basins. WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors) for some basins. WSS WDI
- For some 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

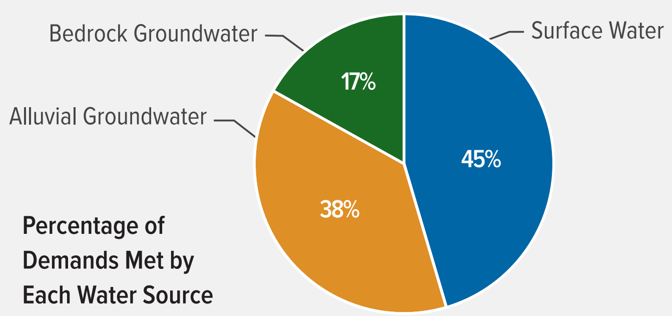
Population

2020	2030	2035	2045	2060	2075
65,515	62,671	60,795	57,436	53,058	47,919

Water Demand Projections

Water demands (withdrawals) are projected to increase by 1% between 2020 and 2075.

The Southwest Region's largest demand sector is Crop Irrigation, representing 94% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 5% 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 Southwest Region, Crop Irrigation demands will increase while Self-supplied Domestic, Self-supplied Industrial, Livestock, and Public Supply demands will decrease between 2020 and 2075. There are no Thermoelectric Power demands. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	588	582	584	579	591	587
Self-supplied Industrial	140	136	127	113	91	68
Crop Irrigation	229,624	235,974	236,408	236,643	236,664	236,664
Livestock	3,348	3,248	3,239	3,151	3,030	2,923
Oil & Gas	264	264	264	264	264	264
Public Supply	16,525	15,753	15,225	14,320	13,087	11,679
Thermoelectric Power	-	-	-	-	-	-
Total	**250,488**	**255,958**	**255,847**	**255,071**	**253,726**	**252,186**

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 Southwest 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	Magnitude (AFY)					**Frequency**
32	-	-	-	-	-	0%
33	2	2	1	-	-	0%
34	187	249	315	310	303	31%
35	-	-	-	-	-	0%
36	3	5	7	7	7	92%
37	18	21	19	15	12	27%
38	810	813	803	803	793	97%
39	-	-	-	-	-	0%
40	-	-	-	-	-	0%
41	7	7	5	3	1	38%
42	-	-	-	-	-	0%
43	-	5	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	Magnitude (AFY)					**Frequency**
32	202	202	202	151	54	4%
33	226	248	125	56	3	1%
34	137	151	163	164	157	34%
35	-	-	-	-	-	No AGW Demand
36	370	445	498	503	504	97%
37	559	616	613	652	657	56%
38	74	68	68	49	41	1%
39	83	88	88	88	88	51%
40	-	-	-	-	-	0%
41	77	79	78	78	78	86%
42	49	55	55	55	55	1%
43	-	-	-	-	-	0%

AFY = acre-feet per year

Physical Water Shortages Cont.

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Magnitude (AFY)**				
32	294	294	294	293	293
33	2,556	2,560	2,562	2,556	2,548
34	20	20	15	16	14
35	207	213	221	221	221
36	287	290	291	291	291
37	4,266	4,298	4,296	4,308	4,320
38	6,550	6,547	6,524	6,485	6,447
39	-	-	-	-	1
40	82	82	80	75	90
41	39,139	39,157	39,113	39,034	38,966
42	403	403	402	400	397
43	149	150	149	150	149

AFY = acre-feet per year

Elm Fork of the Red River

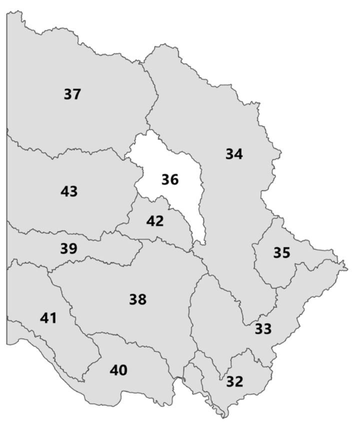
Legal Water Availability WM WSS

Surface water is projected to remain legally available for permitting through 2075 in all of the basins within the Southwest Region except Basin 36. Groundwater is legally available for permitting in all of the Southwest Region basins.

Surface Water Legal Availability

Planning Basins
Basins under GRDA authority
Basins wholly or partially subject to the provisions of the 2016 Water Settlement Agreement

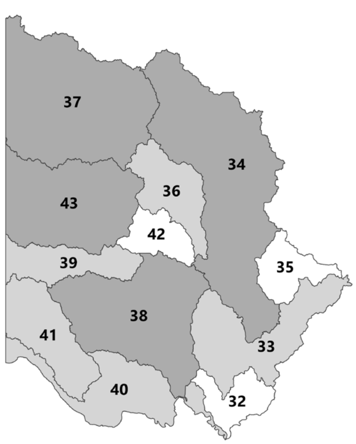
Surface Water Legal Availability (AFY) using 2075 Demands
0
<200,000
200,001-500,000
500,001-2,000,000
2,000,001-4,000,000
>4,000,000



Groundwater Legal Availability

Planning Basins

Groundwater Legal Availability (AFY) using 2075 Demands
<200,000
200,001-500,000
500,001-2,000,000
2,000,001-4,000,000
>4,000,000



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)
Altus City	0
Elk City	0
Tom Steed	0
Lugert-Altus	0

--- 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)
Blaine	Bedrock	Major	temporary 2.0
Elk City	Bedrock	Major	1.0
Hennessey-Garber	Bedrock	Minor	1.6
North Fork of the Red River	Alluvial	Major	1.0
Ogallala Roger Mills	Bedrock	Major	temporary 2.0
Post Oak	Bedrock	Minor	2.0
Red River Reach 1	Alluvium and Terrace	Major	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Salt Fork of Red River	Alluvium and Terrace	Major	temporary 2.0
Southwestern Oklahoma	Bedrock	Minor	temporary 2.0
Tillman Terrace	Alluvial	Major	1.0
Western Oklahoma	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: Raising salinity and a lack of seasonal data, especially in sensitive karst systems, make it difficult to track groundwater quality over time. Major aquifers in the region suffer from elevated levels of nitrates, sulfate, total dissolved solids, and salinity.

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 or hypereutrophic, indicating high productivity and potential water quality concerns. These conditions contribute to a heightened risk of harmful algal blooms (HABs), increased water treatment costs, taste and odor issues, and diminished recreational value—impacting both recreational and water supply beneficial uses.

Streams: Rivers and streams are impacted by erosion, high mineral concentrations, drought-flood cycling, increased sedimentation, and increased nutrient concentrations. These factors contribute to habitat degradation, water insecurity, 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)
$645M	**$593M**	**$13M**

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	$38M	$1.3M	$841M
Small-Medium	$15M	$93M	$149M
Medium-Large	$6.2M	$397M	$66M
Large	N/A	N/A	N/A
Non-Public suppliers	$586M	N/A	N/A
Total	**$645M**	**$1.82B**	**$1.06B**

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.