ONE-PAGE PLACE ASSESSMENT: OKLAHOMA CITY, OK

LOCATED IN THE LOWER NORTH CANADIAN SUBWATERSHED[≈] WITHIN THE ARKANSAS-WHITE-RED RIVER WATERSHED

SUN ⚐1

LATITUDE 35.5°

ELEVATION 1,161 FT / 354 m

	MAR 21	JUN 21	SEP 21	DEC 21
DEGREES N or S of DUE EAST THE SUN RISES[1]	0°	30°N	0°	29°S
DEGREES N or S of DUE WEST THE SUN SETS[1]	0°	30°N	0°	29°S
SOLAR-NOON ALTITUDE ANGLE (ABOVE HORIZON)[a,1,2]	55°	78°	55°	31°

SOLAR-NOON WINTER-SOLSTICE SHADOW RATIO[b] 1 : 1.66 …AND AZIMUTH[c] 0°

9AM & 3PM WINTER-SOLSTICE SHADOW RATIO[b,1] 1 : 3.20 …AND AZIMUTH[c,1] 43°

CLIMATE ⚐2

AVERAGE HIGH & LOW TEMPERATURES[3] *1991–2020*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
°F HIGH	49.3	53.8	62.9	71.1	78.9	87.5	93.1	92.2	83.9	72.8	60.7	50.4	71.4
°F LOW	27.0	30.8	39.5	47.5	57.6	66.2	70.3	69.1	61.5	49.4	37.7	29.5	48.8
°C HIGH	9.6	12.1	17.2	21.7	26.1	30.8	33.9	33.4	28.8	22.7	15.9	10.2	21.9
°C LOW	-2.8	-0.7	4.2	8.6	14.2	19.0	21.3	20.6	16.4	9.7	3.2	-1.4	9.3

RECORD HIGH[4] 113° F | 45.0° C | *August 2012*

RECORD LOW[4] -14° F | -25.6° C | *February 2021*

WIND ⚐3

MAX SPEED[6] 92 MPH | 148 km/h

PREVAILING WIND DIRECTION (FROM WHERE) & AVERAGE SPEED[5]

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
	N/S	N/S	S	S	S	S	S	S	S	S	S	S	S
MPH	12.5	13.1	14.3	14.2	12.5	11.8	10.5	10.2	10.6	11.6	12.3	12.1	12.1
km/h	20.1	21.1	23.0	22.8	20.1	19.0	16.9	16.4	17.1	18.7	19.8	19.5	19.5

WATER ⚐4

AVERAGE RAINFALL (GAIN)[3] *1991–2020*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	1.32	1.42	2.55	3.60	5.31	4.49	3.59	3.60	3.72	3.32	1.68	1.79	36.39
mm	33.5	36.1	64.8	91.4	134.9	114.0	91.2	91.4	94.5	84.3	42.7	45.5	924.3

AVERAGE PAN EVAPORATION (POTENTIAL LOSS)[d,7] *1952–1979*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	–	–	–	6.15	7.60	8.60	9.45	8.71	6.44	4.67	–	–	51.62
mm	–	–	–	156.2	193.0	218.4	240.0	221.2	163.6	118.6	–	–	1,311.1

WETTEST YEAR'S RAIN[4] 56.95 INCHES | 1,447 mm | *2007*

DRIEST YEAR'S RAIN[4] 17.84 INCHES | 453 mm | *1954*

LONGEST PERIOD WITH NO MEASURABLE PRECIPITATION[8]

57 DAYS: *November 4 – December 30, 2021*

RAINFALL INCOME[e] 1,543 GPCD / 5,839 lpcd

AREA[f,9] 606.4 SQ MILES / 1,569.97 km²

POPULATION[f,9] 681,054 *2020*

UTILITY-WATER USE[10] 85 GPCD / 322 lpcd

HISTORICAL | DEPTH TO GROUNDWATER[g,11] | CURRENT

CURRENT GROUNDWATER EXTRACTION | NATURAL GROUNDWATER RECHARGE[h,12,13]

WATERGY ⚐5

% MUNICIPAL ENERGY CONSUMPTION USED TO MOVE & TREAT WATER[i,14]

TOTEM SPECIES ⚐6

AMPHIBIAN: MAMMAL:

FISH: BIRD: REPTILE:

PLANT: MEGAFAUNA:

FOR MORE INFORMATION & HOW TO APPLY IT

⚐ **1.** For more SUN information, see chapters 2 & 4 and appendices 5 & 7 of *Rainwater Harvesting for Drylands and Beyond (RWHDB), Volume 1, 2nd Edition*

⚐ **2.** For more CLIMATE information, see the introduction; chapters 1, 2, & 4; and appendix 5

⚐ **3.** For more WIND information, see chapters 2 & 4 and appendices 5 & 9

⚐ **4.** For more WATER information, see the introduction, chapters 1–4, and appendices 1–5

⚐ **5.** For more WATERGY information, see chapters 2 & 4 and appendix 9

⚐ **6.** For more TOTEM SPECIES information: The ethics, principles, and strategies throughout *RWHDB* help us shift from a negative to a positive impact on these species and their habitats and ecosystems, on which our quality of life also depends.

OKLAHOMA CITY PLACE-ASSESSMENT NOTES

⇜ Usually for subwatershed we like to list the smallest one that encompasses an entire municipality. However, if we were to take this approach with Oklahoma City, this would mean listing the HUC 02 watershed that encompasses the entire state. Instead, we have opted to indicate the middle one of the three HUC 06 subwatersheds that OKC spans, as this one includes the majority of the city, including the airport, downtown, and the Springlake venue hosting the event at which Brad is presenting.

a. The solar-noon altitude angle (a.k.a., solar-noon elevation angle) refers to the number of degrees the sun is located above the equator-facing horizon at solar noon on the given date. In the northern hemisphere, the equator-facing horizon is to the south. In the southern hemisphere, the equator-facing horizon is to the north.

b. The solar-noon winter-solstice shadow ratio is the object's height : length of object's shadow cast on December 21 at noon (the longest noontime shadow of the year). The ratio is 1 : x, where x = 1 ÷ tangent (90 – (latitude + 23.44)).

c. Azimuth is the angle formed between a reference direction (here, due south) to the point on the horizon directly below a given object. Solar noon is the time on any day when the sun's azimuth is 0°. The 9 am & 3 pm winter-solstice azimuth indicates the sun's deviation, in degrees, east/west of due south at those times (–/+ 3 hours from solar noon) on December 21.

d. An evaporation pan holds water whose depth is measured daily as water evaporates. These data allow us to determine evaporation rates at a given location. Compare average rainfall (water gain) to potential water loss via evaporation by checking pan-evaporation rates for your area. If pan-evaporation rates exceed rainfall rates, you are in a dryland environment, where evaporation-reducing strategies such as mulch, windbreaks, shading, and covered water storage are very important.

e. Calculated in situ w/ average rainfall, area, & population

f. Land mass of Oklahoma City proper

g.

h.

i.

j.

CREDITS: Brad Lancaster: Resource concept, content oversight | Megan Hartman: Resource creation, research

OKLAHOMA CITY PLACE-ASSESSMENT REFERENCES

1. Rainwater Harvesting for Drylands & Beyond, Vol 1, or esrl.noaa.gov/gmd/grad/solcalc, accessed 6/15/2026

2. RWHDB Vol 1, or Mar 21 = 90–latitude, Jun 21 = 90–(latitude–23.44), Sep 21 = 90–latitude, Dec 21 = 90–(latitude+23.44)

3. Oklahoma City Will Rogers World Airport station (#13967), www.srcc.tamu.edu, accessed 6/15/2026.

4. Oklahoma City Will Rogers World Airport station (#13967), www.srcc.tamu.edu, accessed 6/15/2026. *Note: The period of record for the record-high and -low temperatures and wettest and driest years is 1948–2026.*

5. Custom Wind Rose Plots, Oklahoma City Will Rogers World Airport 1942–2026, 8-bin, mesonet.agron.iastate.edu, accessed 6/15/2026. *Note: If you require more-detailed wind-direction data, select a greater number of direction bins within the tool.*

6. Record Wind Speed; Oklahoma City, OK; Special Reports: Historical Climate, myforecast.com, accessed 6/15/2026

7. NOAA Technical Report NWS 34: Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States (1982), Lake Overholzer station. semspub.epa.gov/work/01/554363.pdf, accessed 6/15/2026

8. Number of Consecutive Days Precip < 0.01 for Oklahoma City Will Rogers World AP. scacis.rcc-acis.org, accessed 6/15/2026

9. Profiles, data.census.gov/profile?q=Oklahoma+City+city,+Oklahoma, accessed 6/15/2026

10. Residential gallons per capita per day for Oklahoma *County* in 2015, Oklahoma Comprehensive Water Plan (2025), oklahoma.gov/content/dam/ok/en/owrb/documents/water-planning/ocwp/water-demand-forecast-ocwp-2025.pdf, accessed 6/15/2026. *According to the City's municipal website on June 15, 2026, the average gpcd is 67, although it does not specify dates or end-user types.* www.okc.gov/Services/Water-Trash-Recycling/Water.

11.