ONE-PAGE PLACE ASSESSMENT: ATLANTA, GEORGIA

LOCATED IN THE UPPER OCMULGEE & APALACHICOLA SUBWATERSHEDS WITHIN THE SOUTH ATLANTIC GULF WATERSHED

CLIMATE ⚐1

AVERAGE HIGH & LOW TEMPERATURES[1] — 1930 – 2012

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
°F HIGH	52.3	56.2	63.9	72.7	80.3	86.8	88.8	88.0	82.5	73.1	62.8	54.0	71.8
°F LOW	34.2	36.5	42.9	51.0	59.7	67.1	70.2	69.7	64.2	53.0	42.8	36.0	52.3
°C HIGH	11.3	13.4	17.7	22.6	26.8	30.4	31.6	31.1	28.1	22.8	17.1	12.2	22.1
°C LOW	1.2	2.5	6.1	10.6	15.4	19.5	21.2	20.9	17.9	11.7	6.0	2.2	11.3

RECORD HIGH[1]: 106° F | 41.1° C | *June 30, 2012*

RECORD LOW[1]: -8° F | -22.2° C | *January 21, 1985*

SUN ⚐2

LATITUDE: 33.7°

ELEVATION: 1,051 FT / 320 m

	MAR 21	JUN 21	SEP 21	DEC 21
DEGREES N or S of DUE EAST THE SUN RISES[2]	0°	29°N	0°	28°S
DEGREES N or S of DUE WEST THE SUN SETS[2]	0°	29°N	0°	28°S
SOLAR-NOON ALTITUDE ANGLE (ABOVE HORIZON)[a,2,3]	56°	80°	56°	33°

SOLAR-NOON WINTER-SOLSTICE SHADOW RATIO[b]: 1 : 1.55 ...AND AZIMUTH[c]: 0°

9AM & 3PM WINTER-SOLSTICE SHADOW RATIO[b,2]: 1 : 2.97 ...AND AZIMUTH[c,2]: 43°

WIND ⚐3

MAX SPEED[5]: 60 MPH | 97 km/h

PREVAILING WIND DIRECTION (FROM WHERE)[4] & AVERAGE SPEED[4]

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
	NW	NW	NW	NW	NW	NW	WNW	E	ENE	E	NW	NW	NW
MPH	9.6	9.8	10.0	9.3	8.3	7.7	7.5	7.0	7.8	8.2	8.6	9.3	8.6
km/h	15.4	15.8	16.1	15.0	13.4	12.4	12.1	11.3	12.6	13.2	13.8	15.0	13.8

WATER ⚐4

AVERAGE RAINFALL (GAIN)[1] — 1930 – 2012

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	4.52	4.47	5.41	3.99	3.71	3.79	4.80	3.69	3.56	2.83	3.63	4.18	48.58
mm	114.8	113.5	137.4	101.3	94.2	96.3	121.9	93.7	90.4	71.9	92.2	106.2	1233.9

AVERAGE PAN EVAPORATION (POTENTIAL LOSS)[d,6] — 1956 – 1970

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	2.12	2.73	4.28	5.78	7.03	7.10	7.07	6.70	5.22	4.14	2.89	2.26	57.32
mm	53.8	69.3	108.7	146.8	178.6	180.3	179.6	170.2	132.6	105.2	73.4	57.4	1,455.9

WETTEST YEAR'S RAIN[1]: 71.45 INCHES | 1815 mm | *1948*

DRIEST YEAR'S RAIN[1]: 31.80 INCHES | 808 mm | *1954*

LONGEST PERIOD WITH NO MEASURABLE PRECIPITATION[7]: 33 DAYS: *September 12 – October 15, 1935*

RAINFALL INCOME[e]: 694 GPCD / 2,627 lpcd

AREA[f,8]: 133.15 SQ MILES / 344.7 km²

POPULATION[f,8]: 443,775 *2012 est.*

UTILITY-WATER USE[g,9]: 125 GPCD / 473 lpcd

HISTORICAL DEPTH TO GROUNDWATER[h,10]: 5.4 FT | 1.6 m | *1973*

CURRENT DEPTH TO GROUNDWATER[h,10]: 5.84 FT | 1.8 m | *2013*

CURRENT GROUNDWATER EXTRACTION

NATURAL GROUNDWATER RECHARGE[i,9]

WATERGY ⚐5

of AVG GA HOMES THAT COULD BE POWERED w/kWh USED TO MOVE & TREAT ATLANTA'S WATER[j]: 4,991

TOTEM SPECIES ⚐6

PLANT: Pool sprite *(Amphianthus pusillus)* REPTILE: Queen snake *(Regina septemvittata)*

FISH: Cherokee darter *(Etheostoma scotti)* BIRD: Golden-winged warbler *(Vermivora chrysoptera)* MAMMAL:

MOLLUSK: Purple bankclimber *(Elliptoideus sloatianus)* MEGAFAUNA: AMPHIBIAN:

FOR MORE INFORMATION & HOW TO APPLY IT

⚐**1.** For more CLIMATE information, see the introduction, chapters 1, 2, & 4, and appendix 5 of *Rainwater Harvesting for Drylands and Beyond (RWHDB), Volume 1, 2nd Edition*

⚐**2.** For more SUN information, see chapters 2 & 4 and appendices 5 & 7

⚐**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.

ATLANTA PLACE-ASSESSMENT NOTES

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 looking up pan-evaporation rates for your area. According to one definition, if pan-evaporation rates exceed rainfall rates, you are in a dryland environment. Another definition states that drylands are "land areas where the mean annual precipitation is less than two thirds of potential evapotranspiration (potential evaporation from soil plus transpiration by plants), excluding polar regions and some high mountain areas which meet this criterion but have completely different ecological characteristics" (Greenfacts.org). The higher the ratio of potential evaporation to rainfall, the more important evaporation-reducing strategies such as mulch, windbreaks, shading, and covered water storage become.

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

f. City proper

g. Per capita water use was calculated by summing all water used ... from surface and groundwater sources, including public and private water systems and dividing it by the total population. Does not include water sold outside of the 15-county region. The Atlanta Service Area includes the entire city of Atlanta (including portions in DeKalb Co.), unincorporated Fulton County south of the Chattahoochee River, the municipalities of Fairburn, Hapeville, and Union City, and the portion of the Atlanta Hartsfield-Jackson International Airport area in Clayton County. Per Capita figure does not include Palmetto. The per-capita-use rate is trending down. However, the dramatic reductions in 2007–09 are primarily due to the outdoor-water restrictions put in place during the drought, the economic recession and the wet weather in 2009. Single-family residential water use by county is available in a subsequent table in this resource (ref. 10).

h. Site Number: 334207084254801-10DD02, Latitude 33°42'07", Longitude -84°25'48". Well completed in "Piedmont and Blue Ridge crystalline-rock aquifers" (N400PDMBRX) national aquifer. Well completed in "Crystalline Rocks" (320CRSL) local

i. Metro Atlanta is located in the headwaters of six major river basins. The counties within the Metro Water District withdraw drinking water from the Chattahoochee, Coosa, Flint, Ocmulgee, Oconee, and Tallapoosa river basins. The vast majority of the water supply for the Metro Water District, over 99%, is from these surface water sources. Groundwater sources make up less than one percent of the total available water supply in the Metro Water District due to geologic conditions. Groundwater supplies several small towns and is used as a supplemental source (ref. 9). Still, the groundwater levels appear to be dropping slowly. The reason for this has been suggested by a local engineer to be Atlanta's excessive paving and drainage infrastructure which prevent rainfall from infiltrating, instead draining it away from the metro region.

j. The City uses approximately 77,247,130 kWh in one year to pump & treat Atlanta's water (ref. 11). In 2013, 54,296,000,000 were used by the residential sector in Georgia (ref. 12). The total number of households in Georgia is 3,508,477 (ref. 8). Based on this, the average GA household uses 15,476 kWh/year (54,296,000,000 kWh/year ÷ 3,508,477 households). So total kWh pump & treat water (54,296,000,000 kWh/year) ÷ average household usage (15,476 kWh/household/year) = 4,991

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

ALANTA PLACE-ASSESSMENT REFERENCES

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