ONE-PAGE PLACE ASSESSMENT: IRVINE, CALIFORNIA

LOCATED IN THE NEWPORT BAY SUBWATERSHED WITHIN THE CALIFORNIA WATERSHED

CLIMATE ⚐1

AVERAGE HIGH & LOW TEMPERATURES[1] *1902–2012*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
°F HIGH	67.1	68.0	69.9	72.8	75.5	79.1	84.2	85.6	84.7	79.5	74.0	68.0	75.7
°F LOW	40.7	42.8	44.3	47.7	52.0	55.6	59.0	59.2	56.7	51.7	44.6	41.0	49.6
°C HIGH	19.5	20.0	21.1	22.7	24.2	26.2	29.0	29.8	29.3	26.4	23.3	20.0	24.3
°C LOW	4.8	6.0	6.8	8.7	11.1	13.1	15.0	15.1	13.7	10.9	7.0	5.0	9.8

RECORD HIGH[1] 113° F | 45.0° C | *September 27, 2010* — RECORD LOW[1] 18° F | -7.8° C | *January 21, 1937*

SUN ⚐2

LATITUDE 33.7°

ELEVATION 90 FT / 27 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 : 2.96 ...AND AZIMUTH[c,2] 43°

WIND ⚐3

MAX SPEED[5] 82 MPH / 132 km/h

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

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
	S	S	S	S	S	SSW	SSW	SW	SW	SW	SSW	S	SSW
MPH	5.4	6.0	6.6	7.3	7.7	7.7	7.5	6.9	6.2	5.7	5.2	5.0	6.4
km/h	9	10	11	12	12	12	12	11	10	9	8	8	10

WATER ⚐4

AVERAGE RAINFALL (GAIN)[1] *1902–2012*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	2.57	3.06	0.76	0.98	0.29	0.04	0.05	0.02	0.10	1.27	0.89	3.01	13.04
mm	65.3	77.7	19.3	24.9	7.4	1.0	1.3	0.5	2.5	32.3	22.6	76.5	331.2

AVERAGE PAN EVAPORATION (POTENTIAL LOSS)[d,6] *1948–2005*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	2.81	3.45	5.03	6.06	6.76	6.96	7.63	7.48	6.21	5.02	3.58	2.78	63.77
mm	71.4	87.6	127.8	153.9	171.7	176.8	193.8	190.0	157.7	127.5	90.9	70.6	1,619.8

WETTEST YEAR'S RAIN[1] 28.56 INCHES | 725 mm | *1941* — DRIEST YEAR'S RAIN[7] 3.25 INCHES | 83 mm | *2013*

LONGEST PERIOD WITH NO MEASURABLE PRECIPITATION[8]: 194 DAYS: *April 19 – October 30, 1996*

RAINFALL INCOME[e] 173 GPCD / 656 lpcd

AREA[f,9] 66.11 SQ MILES / 171.2 km²

POPULATION[f,9] 236,716 *2013 est.*

UTILITY-WATER USE[10] 84 GPCD / 318 lpcd

HISTORICAL 42 FT | 12.8 m | *1965* — DEPTH TO GROUNDWATER[g,11,12] 105 FT | 32.0 m | *2009* CURRENT

CURRENT GROUNDWATER EXTRACTION > NATURAL GROUNDWATER RECHARGE[h,12]

WATERGY ⚐5

% of CALIFORNIA'S ENERGY USED FOR WATER-RELATED PURPOSES[1,13] 20%

TOTEM SPECIES ⚐6

PLANT: MAMMAL:

FISH: BIRD: REPTILE:

AMPHIBIAN: MEGAFAUNA:

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*

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.

IRVINE 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. USGS well ID# 334205117512501 005S009W31B001S was selected for its proximity to the Eureka Building and for its data's being representational of area trends. The historical depth to groundwater is taken from USGS (ref. 12). However, as the USGS period of record for this well ends in 1986, an approximate current depth to groundwater was derived from Plate 1 on p. 32 of the report in ref. 13. Note that groundwater levels given in Plate 1 are relative to mean sea level (MSL). Thus the land-surface elevation at the well (~40 ft) was added to the groundwater's depth below MSL (~65 ft) to arrive at current depth of ~105 ft.

h. Orange County Water Disctrict is one of Irvine Ranch Water District's primary suppliers of groundwater. As stated in note 3 on page 4 of the report, in the Groundwater Conditions 2008–2009 Summary of Findings, "'Annual overdraft," is defined in the District Act as 'annual basin storage decrease without supplemental replenishment water.'"

i. Water-related energy use in California consumes ~20% of the state's electricity & ~30% of the state's non-power plant natural

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

IRVINE PLACE-ASSESSMENT REFERENCES

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14.