

ONE-PAGE PLACE ASSESSMENT: PORTLAND, OREGON

CLIMATE

AVERAGE HIGH & LOW TEMPERATURES^{1,2} 1928 – 2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
°F HIGH	45.6	50.5	55.6	61.3	67.9	72.9	79.4	79.2	74.4	63.6	52.6	46.8	62.6
°F LOW	36	38.5	40.8	44.1	49.0	53.8	57.5	57.8	54.5	48.2	41.6	37.7	46.7
°C HIGH	7.6	10.3	13.1	16.3	19.9	22.7	26.3	26.2	23.6	17.6	11.4	8.2	17.0
°C LOW	2.2	3.6	4.9	6.7	9.4	12.1	14.2	14.3	12.5	9.0	5.3	3.2	8.2

RECORD HIGH¹ 107 °F 41.7 °C July 2, 1942 RECORD LOW¹ 6 °F -14.4 °C Dec. 30, 1968

SUN

MAR 21 JUN 21 SEP 21 DEC 21

LATITUDE, °	45.5	DEGREES N or S of DUE EAST THE SUN RISES ³	0	36N	0	34S
ELEVATION, FT	33	DEGREES N or S of DUE WEST THE SUN SETS ³	0	36N	0	34S
m	10.1	DEGREES ABOVE SOUTHERN HORIZON SUN IS AT NOON ⁴	45	68	45	21
		SOLAR-NOON WINTER-SOLSTICE SHADOW RATIO ^a	1 : 2.59	...AND AZIMUTH ³	0°	
		9AM & 3PM WINTER-SOLSTICE SHADOW RATIO ^a	1 : 5.70	...AND AZIMUTH ³	41°	

See chapter 4 and appendix 7 of *Rainwater Harvesting for Drylands & Beyond, Volume 1, 2nd Edition*, for more integrated sun- and shade-harvesting tools

WIND

PREVAILING WIND DIRECTION^{b,5} & AVERAGE SPEED⁶

MAX SPEED⁷ 88 MPH 142 kph

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
	ESE	ESE	ESE	S	NNW	NNW	NNW	NNW	NW	NW	ESE	ESE	
MPH	9.4	8.8	7.6	7.7	6.8	7.1	7.3	6.9	6.3	6.3	8.1	9.5	7.6
kph	15	14	12	12	11	11	12	11	10	10	13	15	12

WATER

AVERAGE RAINFALL^{1,2} 1928 – 2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
INCHES	6.4	4.7	4.6	3.0	2.3	1.6	0.5	0.8	1.7	3.5	6.3	7.3	42.7
mm	162.6	119.4	116.8	76.2	58.4	40.6	12.7	20.3	43.2	88.9	160.0	185.4	1,084.6

WETTEST YEAR RAINFALL² 72.71 INCHES 1846.8 mm 1996 DRIEST YEAR RAINFALL¹ 26.20 INCHES 665.5 mm 1929

LONGEST PERIOD WITH NO MEASURABLE PRECIPITATION⁶ 71 DAYS: June 23 – August 1, 1967 RAINFALL INCOME^c 465 GPCD 1,759 lpcd

AREA^d 133.4 SQ MILES 345 km² POPULATION^d 583,776 2010 MUNICIPAL USE⁸ 97 GPCD 367 lpcd

DEPTH TO GROUNDWATER^{e,9} 120 FT 36.6 m 1962 114.9 FT 35.0 m 1988

CURRENT GROUNDWATER EXTRACTION < NATURAL GROUNDWATER RECHARGE¹⁰

WATERGY

of AVG OR HOMES THAT COULD BE POWERED BY PWB'S ELECTRICITY CONSUMPTION¹¹ 1,562

See appendix 9—Water-Energy-Carbon Nexus of *Rainwater Harvesting for Drylands & Beyond, Volume 1, 2nd Edition*, for more

TOTEM SPECIES¹²

PLANT: *Sagittaria latifolia* (Wapato)

MAMMAL: *Neovison vison* (American Mink)

BIRD: *Pandion haliaetus* (Osprey) INSECT: *Sweltsa occidens* (Alpine Sallfly) REPTILE: *Actinemys marmorata* (Western Pond Turtle)

FISH: *Oncorhynchus tshawytscha* (Chinook Salmon) AMPHIBIAN: *Dicamptodon tenebrosus* (Coastal Giant Salamander)

TUCSON PLACE-ASSESSMENT NOTES

- a. Winter-solstice shadow ratio (WSSR) is the object's height : length of object's shadow cast on December 21 at the given time. Year's longest solar-noon shadow occurs on winter solstice. The WSSR is 1 : x, where x = cotangent altitude angle (see ref. 3).
- b. The direction of a prevailing wind indicates the direction *from* which the wind blows
- c. Calculated in situ w/ average rainfall, area, & population
- d. City proper
- e. USGS well ID# 453037122404501 01S/01E-03CBCA, located along SW Pedestrian Trail between Pettygrove City Park (to the north) & SW Harrison St (to the south). This well, completed in the Valley Fill local aquifer, is no longer active. See source in ref. 9 for basic information on this well, including a graph & table of well-level readings, dates, & basic pumping information.

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

TUCSON PLACE-ASSESSMENT REFERENCES

1. Portland WSO City station (#356761), 1/1/1928–6/30/1973, wrcc.dri.edu, accessed 5/4/2012
2. Portland WB City station (#356749), 8/1/1973–11/30/2006, wrcc.dri.edu, accessed 5/4/2012
3. Rainwater Harvesting for Drylands & Beyond, Vol 1, or esrl.noaa.gov/gmd/grad/solcalc, accessed 5/4/2012
4. RWHDB Vol 1, or Mar 21 = 90–latitude, Jun 21 = 90–(latitude–23.44), Sep 21 = 90–latitude, Dec 21 = 90–(latitude+23.44)
5. Portland (PDX) International Airport, www.wrcc.dri.edu/htmlfiles/westwinddir.html#OREGON, accessed 5/4/2012
6. Kevin Donofrio, Meteorologist/Forecaster, NOAA/National Weather Service Office, Portland, Oregon, via email 5/6/2012
7. www.ncdc.noaa.gov/oa/climate/online/ccd/maxwind.html, accessed 5/9/2012
8. 2010–2011 Demand and Consumption Information, Portland Water Bureau, www.portlandonline.com/water/index.cfm?a=29952&c=29460, accessed 5/9/2012
9. nwis.waterdata.usgs.gov/nwis/gwlevels?site_no=453037122404501&agency_cd=USGS&format=gif, accessed 5/27/2012
10. Morgan, D.S., & McFarland, W.D., 1996, Simulation analysis of the ground-water flow system in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Supply Paper 2470-B. Available at pubs.er.usgs.gov/usgspubs/wsp/wsp2470B, accessed 5/27/2012
11. Per *Carbon Footprint Report for Calendar Year 2010*, www.portlandonline.com/water/index.cfm?a=364007&c=31525, accessed 5/9/2012, Portland Water Bureau used 19,236,332 kWh of electricity in 2010, primarily at its pumping stations. Per www.eia.gov/cneaf/electricity/esr/table5.html, the average Oregon home used 1,026 kWh/month, or 12,312 kWh/year in 2009. So 19,236,332 kWh ÷ 12,312 kWh/home = 1,562 homes.
12. Selected with assistance from Chris Prescott, Environmental Specialist, City of Portland, personal communication, 5/21/2012