



WATER USAGE IN ORANGE COUNTY: 2007-2008

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INTRODUCTION

Water usage and water supply have been topics of discussion for many years in Orange County and the Southern California region. As of December 2008, the Metropolitan Water District of Southern California's (MET) water supply reserves have been drawn down by 60%. About half of our water is imported into the region from northern California or the Colorado River watershed. This issue of *Profiles* will look at water usage among the 31 retail water agencies in Orange County, as well as look at reasons why per capita usage varies substantially from agency to agency in the county. Water usage data for 2007-2008 was provided by the Municipal Water District of Orange County and January 2008 population estimates for each of the water agencies' service areas were estimated by the Center for Demographic Research.

WATER USAGE: 2007-2008

There are many different types of water usage: agricultural, municipal, commercial, industrial, and institutional. Within Orange County, there is a wide range of water consumption among the retail water agencies. Agricultural usage has been steadily declining with the urbanization of the county and now only 12 of the 31 water agencies in Orange County reported agricultural usage data for 2007-2008 (Table 1). A different set of 12 Orange County water agencies have constructed recycled water systems and recycled water usage is increasing. These systems significantly reduce their demand on the regional water supplies. Irvine Ranch Water District reported the highest usage of recycled water, 16,693 acre feet (AF), and was followed by the Moulton Niguel Water District (7,587 AF) and the Santa Margarita Water District (5,774 AF).

When comparing water usage of urban areas we consider water usage for municipal, commercial, industrial

and institutional uses, known as M&I, which includes recycled water use. M&I is all water use except for agricultural water use. M&I water usage comes in many different forms. Not only do people use water to brush their teeth, drink, shower, water their yard and decorative water features/fountains, there are also societal uses such as community landscapes, parks, golf courses, gyms, schools, restaurants, offices and shops, etc. In order to compare the M&I usage rates among the Orange County retail water agencies, which greatly vary in size, the data was examined using the resident per capita usage rates. The per capita M&I usage is expressed in the unit of measurement that is most meaningful when analyzing the data: gallons per capita (person) per day (GCPD) which is calculated by dividing the number of gallons used per day by the population in the service area. M&I Per Capita can be considered to be urban water use per resident. For agencies with recycled water systems, the GCPD was based on M&I minus recycled water use.

While the average per capita M&I water usage in Orange County is approximately 175 GCPD, GCPD varies greatly amongst the retail water agencies in Orange County: from about 100 GCPD to over 400 GCPD. Figure 1 shows GCPD for all water agencies in Orange County. Orange Park Acres and the Serrano Water Districts have the highest GCPD in the county with 485 and 450 GCPD respectively. These usage rates, primarily due to large lots and equestrian uses, are more than twice the average GCPD in Orange County, even though they jointly comprise 0.6% of total water usage and 0.25% of the 2008 county population. Other areas, such as Yorba Linda, also tend to have larger lot sizes and report higher GCPD. On the other hand, Santa Ana and much of the western-coastal portion of Orange County is more densely populated and has smaller lot sizes and these have a lower GCPD, in the 109-179 range. Figure 2 on page 4 shows the geographic distribution by GCPD.

**Table 1
Annual Municipal, Commercial, Industrial, and Institutional (M&I) Water Usage in Orange County
2007-2008**

Retail Water Agency	Total Water Usage AF*	Agricultural AF*	Recycled Supply ⁽¹⁾ AF ⁻	M&I Excluding Recycled AF*	2008 Population Served	Gallons Per Capita Per Day
Anaheim, City of	73,461	0	0	73,461	352,980	186
Brea, City of	11,511	92	0	11,419	40,069	254
Buena Park, City of	17,454	0	0	17,454	82,985	188
East Orange County Water District	1,186	1	0	1,185	3,665	288
El Toro Water District	11,422	0	379	11,043	51,623	191
Emerald Bay Services District	334	0	0	334	1,268	235
Fountain Valley, City of	12,450	0	1,452	10,998	58,424	168
Fullerton, City of	31,744	15	0	31,729	137,426	206
Garden Grove, City of	28,927	14	0	28,913	174,515	148
Golden State Water Company	30,695	425	0	30,270	168,683	160
Huntington Beach, City of	31,857	0	0	31,857	203,490	140
Irvine Ranch Water District	96,985	9,269 ⁽²⁾	16,693	71,023	327,513	193
La Habra, City of	10,330	0	0	10,330	62,957	146
La Palma, City of	2,415	0	0	2,415	15,413	140
Laguna Beach Water District	3,874	0	0	3,874	20,528	168
Mesa Consolidated Water District	20,957	0	1,095	19,862	109,624	162
Moulton Niguel Water District	42,670	0	7,587	35,083	169,559	185
Newport Beach, City of	18,341	0	265	18,076	65,317	247
Orange Park Acres Mutual Water Company	952	0	0	952	1,750	485
Orange, City of	34,539	254	0	34,285	139,946	219
San Clemente	11,673	0	616	11,058	55,158	179
San Juan Capistrano	9,883	182	167	9,534	40,357	211
Santa Ana, City of	43,140	0	133	43,007	353,540	109
Santa Margarita Water District	38,675	0	5,774	32,901	151,977	193
Seal Beach, City of	4,036	0	0	4,036	25,588	141
Serrano Water District	3,339	10	0	3,329	6,597	450
South Coast Water District	8,350	0	849	7,501	37,653	178
Trabuco Canyon Water District	4,376	277	981	3,118	14,961	186
Tustin, City of	13,506	22	0	13,484	67,706	178
Westminster, City of	13,746	0	0	13,746	94,555	130
Yorba Linda Water District	24,650	112	0	24,538	76,747	285
Total	657,478	10,673	35,992	610,813	3,112,574	175

Source: Municipal Water District of Orange County: 2008

* Unit of measure is acre feet which is a unit of volume commonly used in the United States in reference to large-scale water resources. An acre foot is approximately 325,850 gallons.

(1) Recycled water listed here may include some non-potable ground and surface water in addition to recycled wastewater. If imported water had been added to the mix, the imported water amount was subtracted out so that the number shown is local water only.

(2) Irvine Ranch WD has some recycled water usage for agriculture. To avoid double-counting, the recycled water amount was subtracted from the Agriculture number shown here.

Notes: Calculations are based upon municipal, commercial, industrial, and institutional (M&I) water usage excluding recycled water.

Column totals may not equal the sum of all water agencies due to rounding.

Orange Park Acres Mutual Water Company has since merged with the Irvine Ranch Water District.

COMMON REASONS FOR VARIATIONS IN WATER USAGE

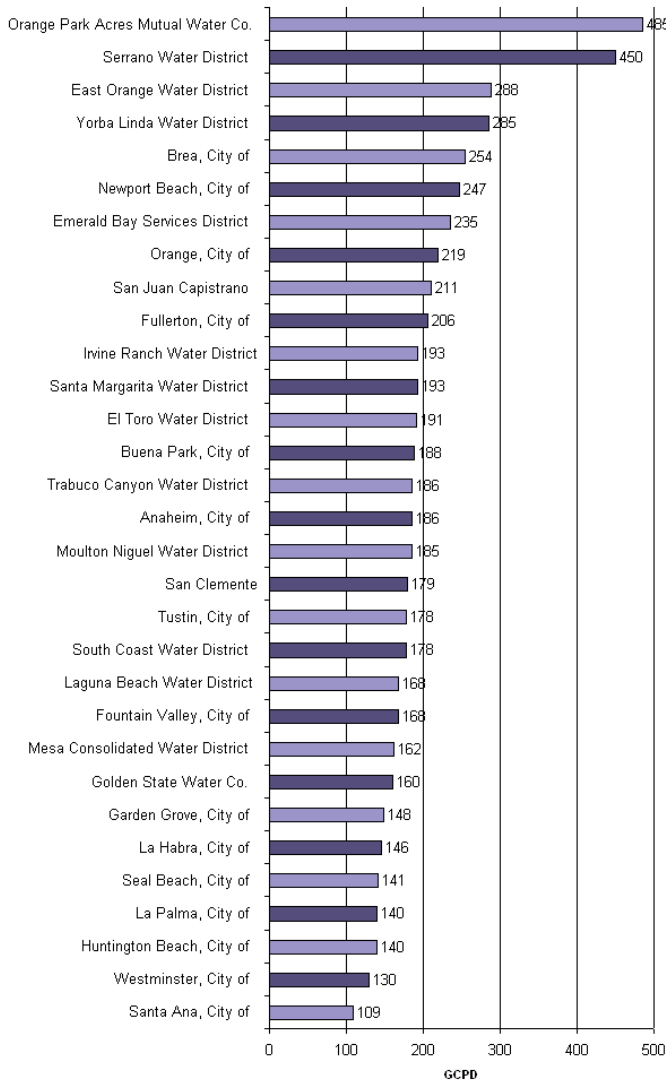
1. Lot Sizes and Slopes: About half of the water usage in Orange County is related to landscape irrigation. District areas with larger average residential lot sizes (Villa Park in Serrano WD, and Orange Park Acres) typically have the most landscaped area per lot, which leads to higher per capita usage rates. Also, irrigated areas, including sloped land, tend to have higher per capita usage than flat or non-irrigated areas.

2. Climate Differences: Even in a small county such as

Orange County, there is enough climate variation to affect water usage. The coastal areas have fog and cooler temperatures which reduce the need for landscape irrigation. In general, the farther inland from the coast, the more water is needed for irrigating landscape due to less cloud cover and less fog.

3. Workers and Visitors: Areas that are centers of employment and/or tourism and entertainment will have higher water usage due to both workers and visitors. The nonresident visitor population consumes water but is not counted in the population estimates. This effect is difficult to quantify. Although Anaheim has the highest tourism

Figure 1
Gallons Per Capita Per Day (GCPD) by
Orange County Retail Water Agency: 2007-2008



Source: Municipal Water District of Orange County

Note: Calculations are based upon municipal, commercial, industrial, and institutional (M&I) water usage excluding recycled water. Orange Park Acres Mutual Water Company has since merged with the Irvine Ranch Water District.

levels in the county (e.g. Disneyland Resort, Honda Center, and Anaheim Convention Center), when the usage rates, which contain the worker and visitor usage, are combined with Anaheim’s large resident population, the effect on GCPD is not as large as it would be in a city with a smaller resident population.

4. Water Rate Structure: An aggressively tiered water rate structure, where usage above a certain volume (tier) is sold at a higher price, is effective in reducing consumer demand,

as compared to non-tiered or minimally tiered rates. Thus, water usage should be lower, on average, in districts where there is an aggressively tiered rate structure. For more information on tiered rates structures, please visit: www.mwdoc.com/documents/WaterRateSurvey2008.pdf

5. Old Toilets: All buildings constructed after 1992 have water conserving toilets that use 1.6 gallons or less per flush. Older buildings and residences may still have higher water-using flush toilets. The north half of the county has more older buildings and toilets than the southern portion of the county; therefore, indoor water usage should be higher in the northern half of the county.

6. Outreach by the Retail Water Agency: Active water conservation efforts by the retail water agencies have resulted in faster replacement of older toilets and other water fixtures and a higher awareness of water conservation by the water-using public. These outreach efforts, through information sharing, education and incentives, have resulted in changed consumer behavior. Currently, there are a number of rebate programs available to residents, businesses, and the public sector. The rebates are for a variety of things including high efficiency toilets, washers, and smart timers.

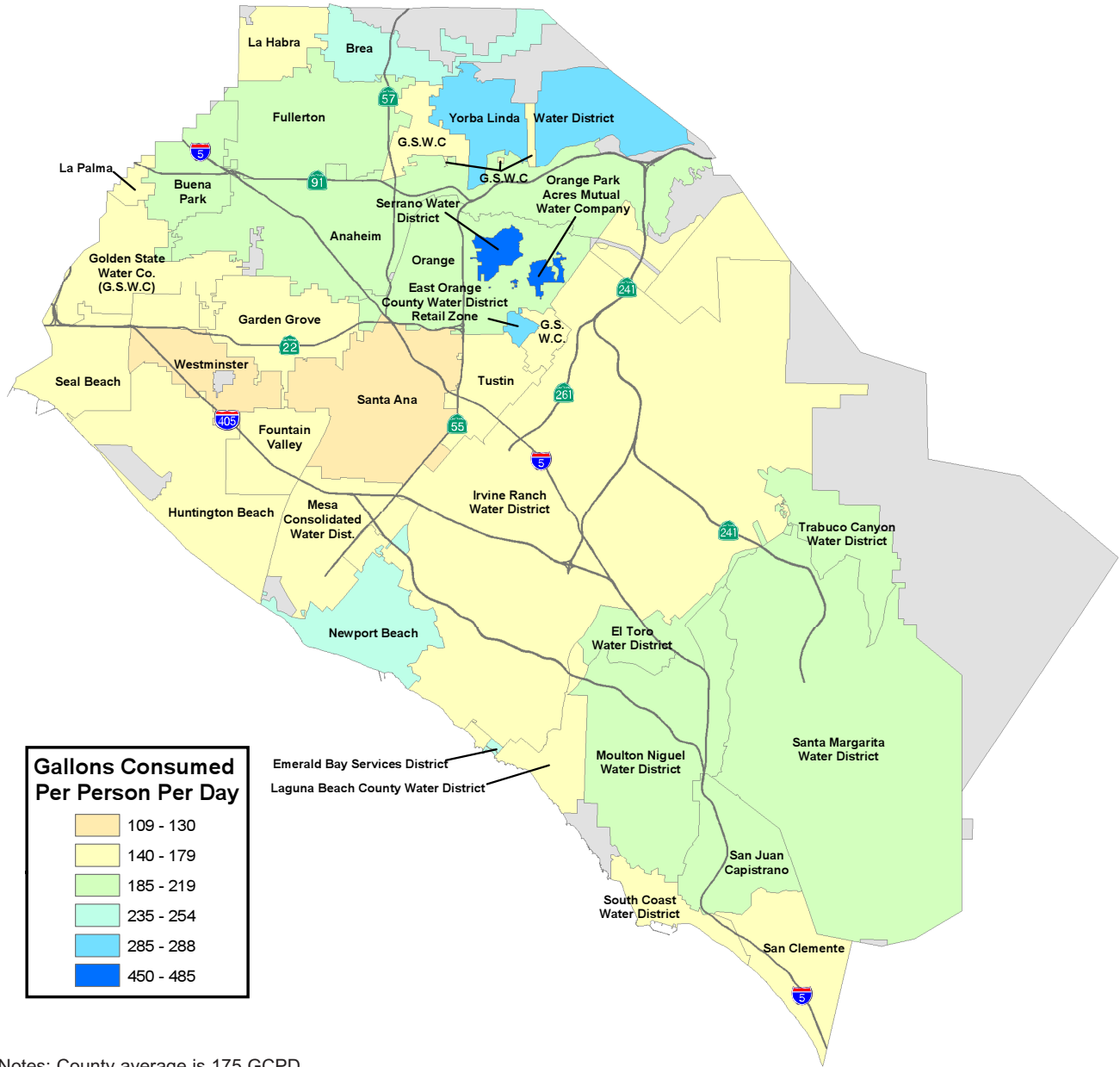
CONCLUSION

There are a number of variables that affect an area’s level of per capita M&I water usage. Proximity to the coast, smaller lot size, absence of irrigated slopes, recycled water systems, low tourism and job base, tiered rate structure, and strong water agency outreach are associated with low per capita usage. Conversely, distance from the coast, larger lot size, slope irrigation with potable water, higher tourism levels, large job base, and lack of water agency outreach are associated with a higher per capita usage.

As of December 2008, Metropolitan Water District of Southern California’s remaining water supply reserves are at 40%. This issue of *Profiles* shares some of the factors that affect water usage and how complex the issue of water conservation and usage is by showing the variety within Orange County alone.

For more information visit www.mwdoc.com

Figure 2
Number of Gallons Consumed Per Capita Per Day by Orange County Retail Water Agency: 2007-2008



Gallons Consumed Per Person Per Day	
	109 - 130
	140 - 179
	185 - 219
	235 - 254
	285 - 288
	450 - 485

Notes: County average is 175 GCPD.
 Boundaries are shown by retail water agency.
 Grey areas are not within the boundaries of an Orange County retail water agency.
 Orange Park Acres Mutual Water Company has since merged with the Irvine Ranch Water District.
 Source: Municipal Water District of Orange County (MWDOC)

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