

2018

**ANNUAL SURVEY OF WHOLESALE CUSTOMERS:
SUMMARY OF RESULTS**

Consumption Data for 2017
Rates Data for 2018



Seattle
 Public
Utilities

December 2018

RESULTS OF THE 2018 SEATTLE SURVEY OF WHOLESALE CUSTOMERS

Each year, Seattle Public Utilities (SPU) asks its wholesale customers to provide information on their current water demand (both retail and wholesale), sources of supply (in addition to SPU), and their water rates. A complete set of this data by wholesale customer and by year is of critical importance in Seattle Public Utilities' efforts to better forecast wholesale demand. Wholesale customers often find the current and historical information provided in this report useful in their own analysis and planning. It also allows them to see how they compare to other wholesale customers and Seattle in a number of areas.

This report summarizes much of the data that was collected in the 2018 wholesale customer survey and is the 25th year the report has appeared in this format. *Seattle Public Utilities appreciates the time and effort each wholesale customer has taken in completing and returning the survey.* Comparative information is presented on water rates, bills and consumption patterns. Questions about this report or requests for data from the surveys should be directed to Emiko Takahashi at (206) 615-1695. Copies of current and past reports (back to 2005) can be downloaded from the Wholesale Customers page of SPU's [website](#).

Overview

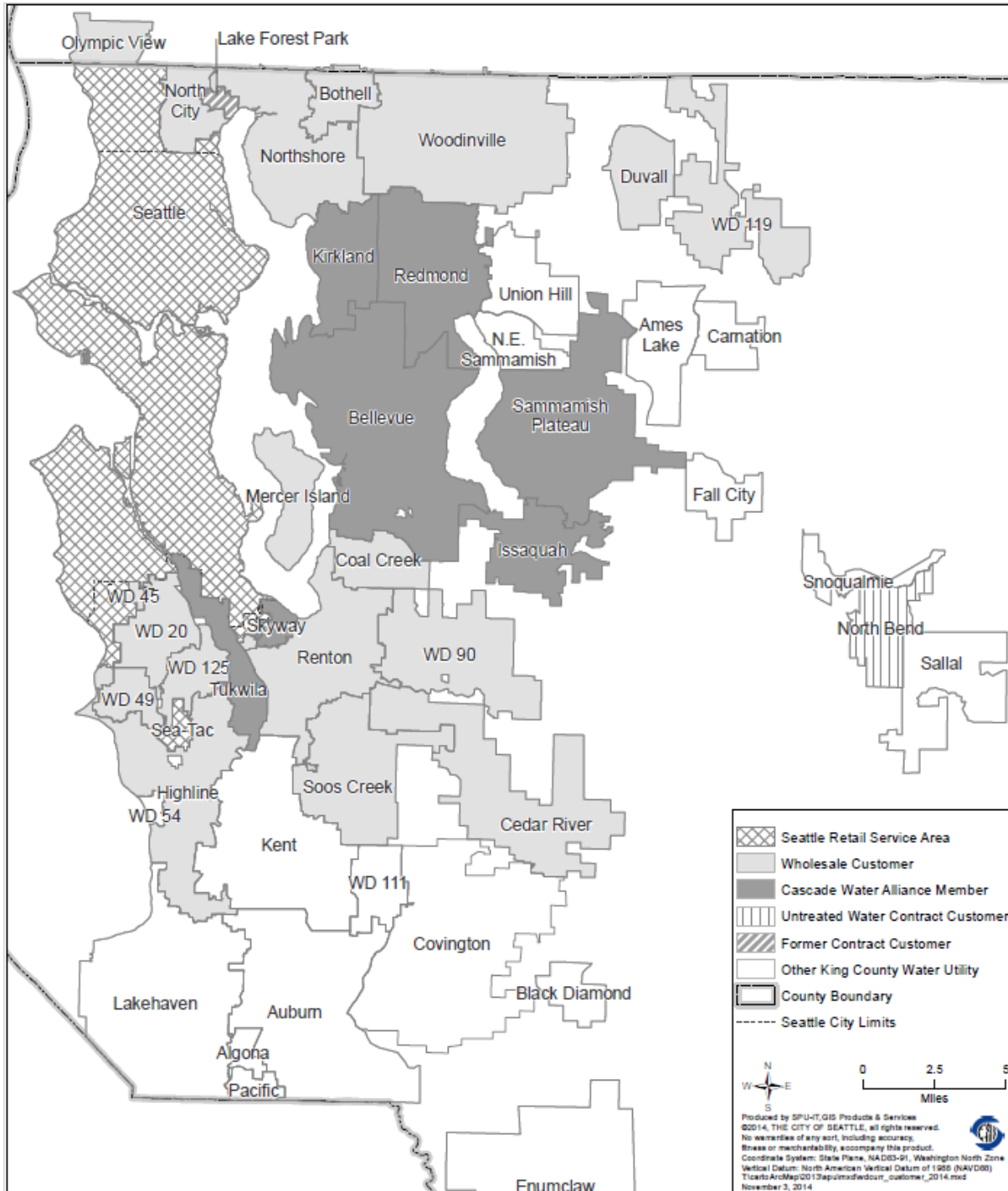
About half the water produced and treated by Seattle Public Utilities is sold directly to customers in Seattle's retail service area. The rest is sold wholesale to the Cascade Water Alliance and 18 neighboring cities and water districts. These wholesale customers are listed below.

Wholesale Customers of Seattle Public Utilities

<u>Cities</u>	<u>Water Districts</u>	<u>Cascade Water Alliance</u>
· Bothell	· Cedar River Water & Sewer District	· City of Bellevue
· Duvall	· Coal Creek Utility District	· City of Issaquah
· Mercer Island	· Highline Water District	· City of Kirkland
· Renton	· Northshore Utility District	· City of Redmond
	· North City Water District	· City of Tukwila
	· Olympic View Water & Sewer District	· Sammamish Plateau W & S District
	· Soos Creek Water & Sewer District	· Skyway Water & Sewer District
	· Woodinville Water District	
	· Water District No. 20	
	· Water District No. 45	
	· Water District No. 49	
	· Water District No. 90	
	· Water District No. 119	
	· Water District No. 125	

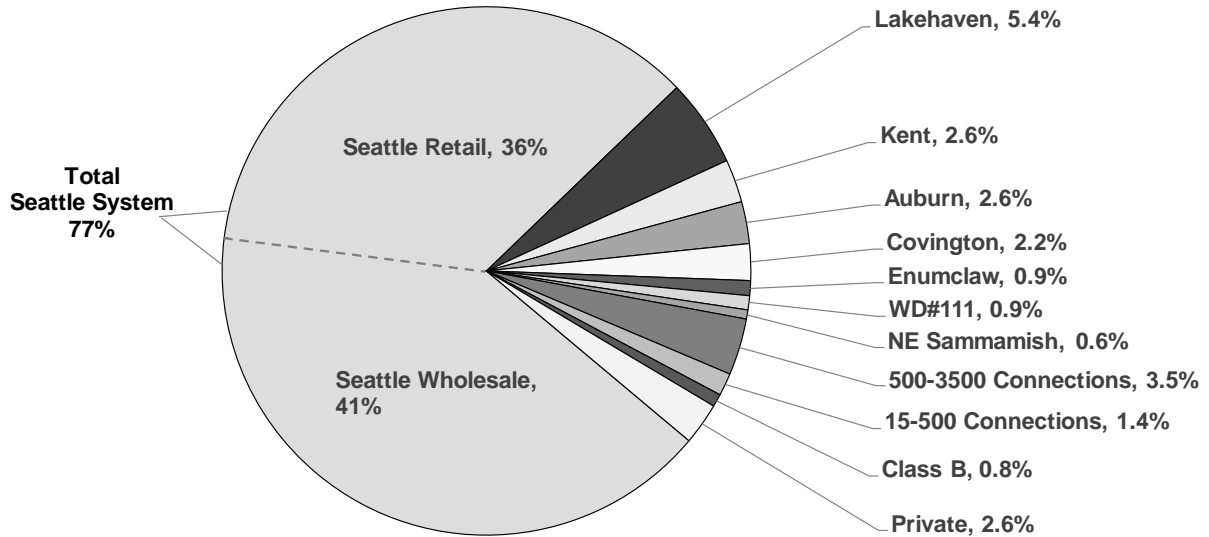
Note that the city of North Bend is not included in the survey though it has contracted with Seattle Public Utilities to receive untreated mitigation water from the Cedar River watershed.

Water Utilities in King County



While there are almost 1,500 public water systems in King County and an estimated fourteen thousand private systems, the 33 largest water utilities serve about 92% of the county’s population. Seattle and its wholesale customers alone provide water to over three quarters of the population of King County as well as 14,965 people in the southwest corner of Snohomish County.

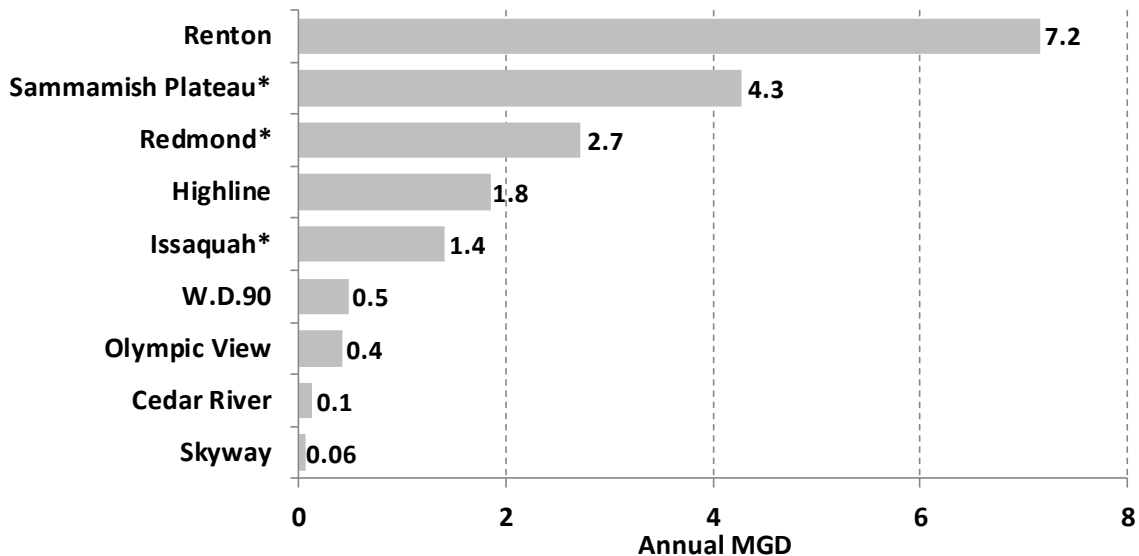
Percent of Population Served by Water Providers in King County



Supply: Seattle Public Utilities has two surface water sources and a small ground water source: the Cedar River system, the South Fork Tolt Reservoir, and the Seattle Well Field (used primarily for summer peaking). On average, the Cedar River system provides about 70 percent of total supply, the South Fork Tolt system delivers 29 percent, and the Seattle Well Field delivers 1 percent. Total annual average firm yield from the current system is estimated at 172 million gallons per day (mgd).

A number of Seattle’s wholesale customers have their own sources of supply, which reduces their demand from the SPU supply system. As shown in the table below, wholesale customers obtained a total of about 18 mgd from their own sources of supply.

Water Obtained from Own Sources of Supply: 2017

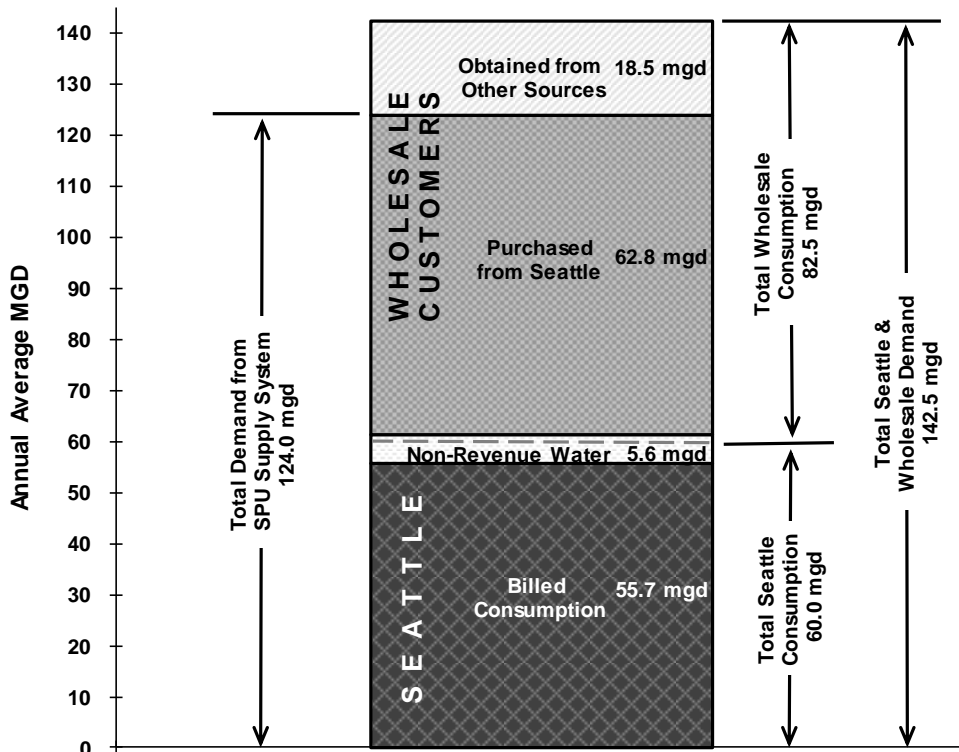


* Members of Cascade Water Alliance

Demand: Seattle and wholesale water demand totaled 142.5 mgd in 2017 after another hot summer, up 2.5 mgd from 2016. Of the 142.5 mgd total, 124.0 mgd came from the SPU supply system and 18.5 mgd was obtained from wholesale customers’ own sources of supply. Various

components of Seattle and wholesale demand are shown in the chart, below¹. Seattle demand was 60.0 mgd including 4.4 mgd of non-revenue water. Total wholesale demand of 82.5 mgd consisted of 62.8 mgd from Seattle (62.8 mgd purchased and 1.2 mgd transmission losses) and 18.5 mgd obtained from other sources. Included in wholesale demand, but not shown separately on the chart, is almost 5 mgd of distribution system non-revenue water.

Components of Seattle and Wholesale Water Demand in MGD: 2017



How Seattle system water consumption has changed over time can be seen in the graph below. While population has risen steadily since 1975, total water demand leveled off during the 1980s at about 170 mgd before dropping off sharply due to the 1992 drought. During the rest of the 1990s, the combined effects of rising water rates, the 1993 plumbing code, conservation programs, and improved system operations kept total consumption at or just under 150 mgd – well below pre-drought levels. In the following decade, increasingly efficient appliances and fixtures and the impact of the 1% Conservation Program further extended the downward trend. By 2010, the amount of water provided by the SPU supply system bottomed out at about 118 mgd. Since then, continued conservation investment through the Saving Water Partnership and improvements in appliance/fixture efficiencies have been enough to offset the recent spurt in population growth. The result has been a leveling off of water demand during the current decade.

There appears to have been an uptick in water demand over the past several years but that is due entirely to the weather and specifically a spate of hot, dry summers. Every summer starting in 2013 has been significantly warmer than average. The summer of 2015 was the hottest on record but others were close. Looking at daily high temperature averaged over

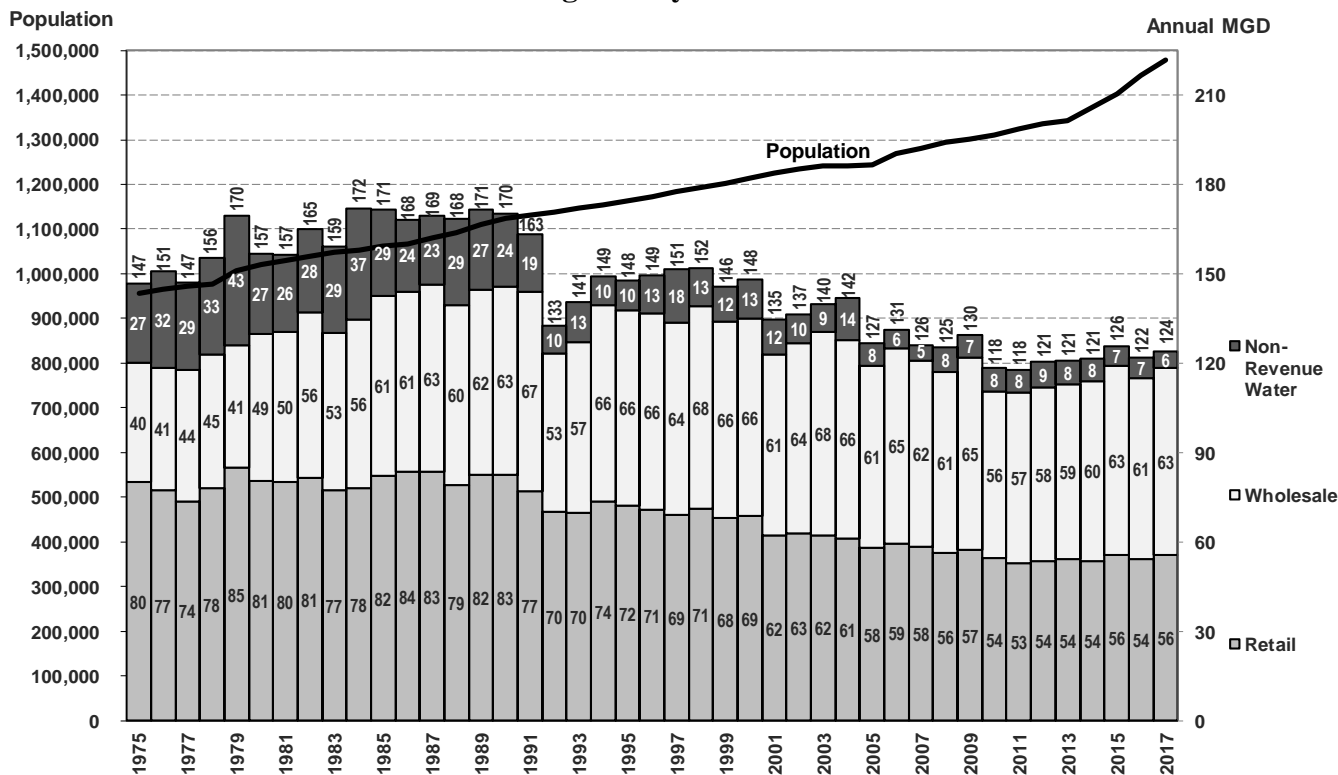
¹ Components may not add to total due to rounding.

each year's hottest 3-month period, there are only seven years on record (since 1949) with 3-month averages at 78° or higher (normal is 74.4°). Five of those seven have been in the last 6 years (2013-2018 excluding 2016). And while 2017 wasn't quite as hot as 2015, it posted the *driest* 3 months on record. Another way to confirm the current flat demand trend is to focus on winter base consumption which eliminates summer variability. While base consumption dropped 40 mgd over the last 2½ decades, it appears to have bottomed out at 102 mgd where it's been for the past 5 years.

In percentage terms, total Seattle system water consumption has declined 27% since 1990 while population has *increased* 32%. As a result, total consumption *per capita* is 45% less than it was in 1990.

Wholesale demand from the Seattle water system grew by two thirds from 40 mgd in 1975 to 67 mgd in 1991. Following the 1992 drought though, wholesale demand leveled off (averaging 66 mgd) for the next decade and a half before dropping to around 60 mgd the last eight years. Seattle retail demand was essentially flat between 1975 and 1991 (averaging 80 mgd) but trended steadily downward before leveling off at about 54 mgd after 2010. Finally, non-revenue water was cut by more than half due to actions taken by Seattle just before and during the 1992 drought.² Seattle's now-completed program to cover all its in-city reservoirs further reduced non-revenue water to an average of about 6 mgd (5%).

**Population* and Components of Annual Water Demand in MGD
Seattle Regional System: 1975-2017**



* Population has been adjusted downwards to reflect that some wholesale customers have other sources of supply in addition to what they purchase from SPU. For example, only 67% of Olympic View's population is counted, the proportion of its total water consumption that is provided by SPU.

² These actions included reducing in-city reservoir overflows, eliminating regular flushing of Green Lake, relining leaky reservoirs, changing reservoir washing practices, and rehabilitating and replacing other reservoirs.

Water Rates

Residential and commercial rates in effect during 2018 for each wholesale customer and Seattle are summarized in Tables 1.1 and 1.2. Quite a variety of rate levels and structures are evident. All wholesale customers levy a commodity charge and a fixed monthly base service charge (BSC) or meter charge which, in a few cases, also includes a minimum level of consumption per month. There are three basic commodity rate structures and one hybrid: uniform rates, seasonal rates, inclined block rates, and seasonal rates with inclined blocks. Fixed monthly charges on a ¾" meter, the usual size for residential meters, average \$20.97 per month with a range of \$14.20 per month to \$42.00 per month. The range of fixed monthly charges on 2" meters, typical of commercial accounts, is even greater: \$18.50 per month to \$244.90 per month.

Utility Taxes: All water utilities pay a state utility tax of 5.029% applied to total revenue from providing retail water service. Almost half the wholesale customers plus Seattle are assessed additional taxes and fees by their local municipal government(s). The average tax rate across all wholesale customers is 8.7% of total retail revenue. Seattle has the highest tax rate with 20.6% of its retail revenue going to state and city taxes. Note that some wholesale customers do not include taxes and fees in their published water rates and instead itemize them separately on their customers' bills. In order to make rates and bills comparable between utilities, those taxes and fees have been added back into the rates as shown in Tables 1.1 and 1.2 and into the bill calculations.

Residential Rates: For more than 10 years, neither Seattle nor any of its *current* wholesale customers have had a uniform rate structure,³ i.e., a single rate per ccf for all volumes and times of the year. Only one wholesale customer (Tukwila) has straight seasonal rates: a single rate in the winter and a single higher rate in the 4-month summer season. Eighteen wholesale customers have simple inclined block rates with from two to five blocks. The size of the blocks is indicated in the "Block Thresholds" column of the tables. For example, Water District 49 has three blocks: the first from 0 to 5 ccf per month, the second from 6 to 8 ccf per month and the last for 9 or more ccf per month. There is considerable variation in the number and size of the blocks and in the rates themselves. Finally, seven wholesale customers and Seattle use various combinations of seasonal and block rates. Olympic View, Woodinville, and Water Districts 90 and 119 have block structures that shift to higher rates in the summer. So does Soos Creek, except there is no higher summer rate in the first block. Similarly, Mercer Island has multiple blocks but no higher summer rates in the first two blocks. Seattle and Highline have single winter rates with blocks only in the summer.

The diversity of residential rate structures results in very different price signals to customers during the peak season. Residential customers of wholesale utilities face marginal summer rates ranging from \$2.87 to \$20.57 per ccf. The average summer end-block rate (including Seattle) is \$7.47 per ccf. Two wholesale customers (Issaquah and Mercer Island) plus Seattle now have end-block rates exceeding \$10 per ccf. Issaquah has the highest summer end-block rate: \$20.57 per ccf for consumption exceeding 25 ccf per month.

Commercial Rates: Seven wholesale customers apply the same rates and rate structures to both their commercial and residential customers. Tukwila maintains the same seasonal

³ Two former wholesale customers, Lake Forest Park and Edmonds, still have uniform rates

structure but changes the rates. Northshore and Olympic View keep the charges the same rates but change the block sizes. The remaining fifteen plus Seattle change the rates *and* the structure, usually shifting from inclined block and hybrid structures to uniform or seasonal rates, but occasionally just reducing the number of blocks. The highest rate is \$9.54 per ccf and the average summer end block rate (including Seattle and uniform and seasonal rates) is \$5.60 per ccf.

Customer Bills: Figures 1.1 through 1.4 and Tables 1.3 and 1.4 compare monthly residential bills across wholesale customers. Three consumption levels, defined below, are used throughout:

Monthly Consumption Levels Used in Calculating Bills

Level of Household Consumption	Winter	Summer	Average Annual
Low	3.5 ccf/mo	5 ccf/mo	4 ccf/mo
Medium	6 ccf/mo	9 ccf/mo	7 ccf/mo
High	12 ccf/mo	21 ccf/mo	15 ccf/mo

Note that as of the 2016 survey, these consumption levels have been lowered from what had been used in all previous survey reports. Medium consumption had been defined as 8 ccf/mo in the winter and 12/ccf/mo or 9.33 ccf/mo on an average annual basis. This reflected typical residential consumption in the mid-1990s for wholesale customers. However, average consumption has declined significantly since then and appears to have leveled off at about 7 ccf/mo (see Table 2-4, page 31). The new low, medium, and high consumption levels used for bill comparisons are more representative of current consumption patterns.

Figures 1.1, 1.2 and 1.3 graphically display monthly residential bills by wholesale customer at low, medium, and high levels of consumption. The figures also rank wholesale customers (including Seattle) by the size of their bills revealing two interesting facts. One is that there are big differences in what households pay for water among different utilities. Monthly bills from utilities with the highest rates are as much as two and a half times as large as those from utilities with the lowest rates. Average monthly bills range from \$22.17 to \$55.49 at the low level of consumption and \$58.81 to \$124.33 at the high level of consumption.

A utility’s average residential water bill is a function of both its rates *and* its average residential consumption. A problem with most comparisons of water bills across utilities (including the comparisons in Figures 1.1 through 1.3) is that the comparisons use a single level of consumption to calculate the bills. But if the chosen level of consumption is typical for one utility, it may not be for another. Consider two utilities having exactly the same rates. One could have higher average bills than the other because its average consumption is higher. To correctly compare average bills across utilities, each utility’s bill should be calculated at its average level of consumption. This has been done in Figure 1.4. Average monthly residential consumption in 2018 ranged from 5.1 ccf per month in Seattle to 9.3 ccf per month in Kirkland. In Figure 1.4, Redmond has the lowest average residential bill while Water District 119 tops the list. Water District 119’s volume rates are close to average but it has some of the highest per household consumption,⁴ with by far the highest residential meter charge.

⁴ W.D. 119 has not provided consumption data since 2015; therefore its 2015 consumption is used here.

There are many possible explanations for the wide variation in residential rates and bills. These include utilities having:

- different financial policies,
- different levels of investment in new and replacement infrastructure,
- different proportions of rate revenue, non-rate revenue, and debt,
- different proportions of residential and commercial customers,
- different cost allocations between customer classes,
- different customer densities,
- and different rates of customer and service area growth.

The other phenomenon revealed by the graphs is how much wholesale customer rankings can change at different levels of consumption, i.e., the wholesale customer with the highest bill at one level of consumption may be far from the highest at other levels of consumption. For example, Issaquah has the highest bill at high consumption, is right in the middle at medium consumption, and has the seventh *lowest* bill at low consumption, Sammamish Plateau is a good example of the opposite pattern, moving up from the third lowest bill at high consumption to fifth *highest* bills at low consumption. Finally others, such as Water District 49 and Northshore, maintain their relative ranking at all levels of consumption. (Table 1.4 summarizes the different rankings from Figures 1.1 through 1.3.)

There are two factors that explain the shifts in relative rankings of wholesale customer bills at different levels of consumption. One is different rate structures. For example, a steeply inclined block structure tends to favor low volume users while a flatter rate structure favors high volume users. Perhaps even more important is the relative magnitudes of the fixed and variable components of the rates. Higher meter charges relative to volume charges result in higher bills for low volume users and proportionally lower bills for high volume users. The combined impact of these factors can be seen in Table 1.4. In general, wholesale customers with relatively high meter charges and relatively low volume charges move down in the rankings (their bills get smaller compared to other wholesale customers) as consumption increases. Wholesale customers with lower meter charges and higher or steeply inclining volume charges tend to move in the opposite direction, placing higher in the rankings as consumption increases. In many cases, the "meter charge effect" offsets the "rate structure effect" so that the wholesale customer maintains its ranking across all consumption levels. Table 1.3 displays monthly bills at the medium level of consumption (graphed in Figure 1.2) and the difference between winter and summer bills by wholesale customer. Note that the summer/winter differential is not the differential in *rates* but in *bills*. Many wholesale customers have a differential of less than 50% even though bills are calculated with 50% more consumption in summer than in winter. This means that the *average* rate charged *per ccf* by these wholesale customers is actually *less* in the summer than in the winter. This seemingly contradictory result is due to the impact of the meter charge which is spread over a greater number of ccf in the summer. This effect diminishes as the level of consumption rises and the meter charge represents a smaller and smaller proportion of the total bill. Issaquah, Woodinville, Tukwila, and Soos Creek have differentials of more than 50%, a sign that the *average* rate charged per ccf in the summer is greater than in the winter. This is because they tend to have relatively low monthly meter charges and/or very steeply inclined block structures and/or seasonal rates with significant increment between peak and off-peak rates.

Water Bills Over Time: The rates and consumption data collected from wholesale customers over the decades allows an estimate of how residential water bills have changed

over time for each utility. Figure 1.5 shows total and average annual rates of growth in residential water bills from 1995 to 2018 with utilities ranked from the highest rate of growth to the lowest. The ten utilities at the bottom have experienced no more than a 15% total increase in residential water bills (after adjusting for inflation) over the past 23 years. That's 0.6% or less on an average annual basis. Cedar River, Olympic View and Water District 20 actually saw slight declines in their water bills over that period. The average rate of increase for all wholesale customers was 28% or 1.1% annually. Finally, four wholesale customers plus Seattle have had their water bills increase by over 60% or 2% annually since 1995. Bellevue and Kirkland are at the top with about 3% average growth in water bills each year (which means bills have doubled over 23 years) with Seattle close behind with 2.8% average annual growth. Once again, these numbers reflect the combined effects of increases in water rates tempered by decreases in average residential consumption.

Consumption Patterns

Annual Consumption: Figures 2.1 and 2.2 display annual water purchases from SPU and annual retail water sales by wholesale customer for 2017. Note that annual purchases from SPU are often very different than wholesale customers' retail demands. Purchases from SPU are less than the actual demand of wholesale customers who have their own sources of supply or who buy from others. And while most Cascade members still obtain water directly from SPU's transmission system, they no longer purchase it directly from SPU. Instead, the Cascade Water Alliance pays SPU for what is owed and then bills its members. Some water purchased by Cascade is wheeled to members who may not have direct connections to the Seattle system such as Issaquah and Sammamish Plateau (for example, some of the water shown in Figure 2.1 as "purchased" by Bellevue ends up in Redmond, Issaquah, or Sammamish Plateau).

Tables 2.1 and 2.2 provide a historical perspective by displaying 14 years of data on annual retail consumption by wholesale customer and wholesale purchases from Seattle. Historical consumption data for years prior to 2008 have not been obtained from Issaquah and Sammamish Plateau.

Consumption Trends: Figure 2.3 shows the growth, or in over half the cases, the decline in total retail water consumption for Seattle and each of the wholesale customers over the 22-year period 1995 to 2017. Ten utilities, most in expanding and faster growing areas, have experienced positive water demand growth since 1995 (though for three, W.D. 45, Tukwila, and Soos Creek, demand has been almost flat). The rest are using less water than they did 22 years ago. Total 2017 water demand for all wholesale customers is virtually the same as it was in 1995 so that there has been zero net growth over the period. The largest decreases have been in North City, Water District 20, Seattle, and Water District 49 where water demand has dropped by 22% to 24% (1.2% - 1.3% a year). This indicates that for Seattle and half of its wholesale customers, the combined effect of conservation programs, fixture and appliance codes, and rising water rates has more than offset the impact of growth in the customer base. (Note that the apparent even larger decline for Coal Creek (42%) is due to the annexation of much of its service territory by Bellevue in 2003. The decline in demand for Coal Creek and Bellevue combined is just 6.1% over the last 2 decades.)

Non-Revenue Water: Figure 2.4 ranks wholesale customers by percent of non-revenue water in 2017, i.e., the percent of their total water purchases and production that is not sold.

Percent non-revenue water for 2014, 2015, and 2016 is also shown. Table 2.3 shows annual distribution system percent non-revenue water by wholesale customer for the years 2003 through 2017 and the average for each wholesale customer for as many years as data is available – usually back to 1994. Percent non-revenue water is calculated as follows:

$$(PS + PO + OS - RS - WS) \div (PS + PO + OS)$$

where

- PS = Water Purchased from Seattle
- PO = Water Purchased from Others
- OS = Water obtained from Own Supply
- RS = Water Sold Retail
- WS = Water Sold Wholesale

There are many causes of non-revenue water. Some are necessary and/or beneficial such as water main flushing, reservoir cleaning and water taken from hydrants for fire-fighting, street cleaning and some construction projects. Others, however, are undesirable and represent wasted water or lost revenues. These include leaks from pipelines and reservoirs, inadvertent reservoir overflows, theft and slow customer meters. For a newer water system efficiently operated, the percentage of non-revenue water might be expected to creep down towards 5%. Non-revenue water above 10% should prompt some analysis of what the cause might be, and non-revenue water in excess of 15% is definitely a call to action.⁵

The average level of non-revenue water for wholesale customers was 5.4% in 2017⁶. Since 1994, average wholesale distribution system non-revenue water has varied from 5.3% to 9.9% averaging 7.3% over the whole period.

Measurement problems contribute to at least some of the year-to-year variation in non-revenue water evident in Table 2.3 and Figure 2.3. Billing lags and supply meter inaccuracies are two problems that make the precise measurement of non-revenue water difficult. Because of differences in the length of billing lags, the measure of annual wholesale water sales generally doesn't span the exact same period as the measure of annual purchases and production. These two measures of water consumption, the difference of which provides our estimate of non-revenue water, may be offset by as much as two months. Fortunately, these months are in the middle of winter when consumption tends to be relatively constant from month to month. The problem would be much worse if the end of the year coincided with the peak season.

⁵ The state Water Efficiency Rule requires water utilities to report their Distribution System Leakage (DSL) to the Department of Health annually, and to take action if the 3-year moving average exceeds 10%. Note that non-revenue water is different than DSL. All water produced or purchased but not sold is considered non-revenue water. DSL starts with non-revenue water but subtracts out all authorized uses of water that do not generate revenue but can be measured or estimated. These include water used for reservoir cleaning and overflowing, main and hydrant flushing, firefighting, and other hydrant use such as construction and street sweeping. If measured, transmission losses can also be deducted in calculating DSL. A utility's estimate of DSL will be less than its non-revenue water to the extent that these non-revenue-generating but authorized uses are taken into account.

⁶ Seattle non-revenue water averaged 5.8% for 2005 through 2017. Percent of non-revenue water for Seattle is not included in Figure 2.3 because it is not directly comparable to wholesale non-revenue water. For wholesale customers, non-revenue water is a distribution system concept. Water lost in transmission from Seattle's sources to wholesale meters is not part of the calculation. However, Seattle non-revenue water consists of both distribution and transmission losses to Seattle plus wholesale transmission losses. Comparing Seattle and wholesale non-revenue water would be misleading unless the distribution system component of Seattle non-revenue water could be isolated. Unfortunately, that is not possible with currently available data.

Slow *wholesale* meters have represented a much more serious problem in measuring non-revenue water by reducing the apparent difference between the amount of water entering a wholesale customer's system and the amount of water sold by that wholesale customer. Extremely low levels of non-revenue water (under 3%) suggest that there is probably some kind of metering problem. Negative non-revenue water, i.e., when metering data implies that more water has been sold than was produced and/or purchased, is a sure sign that one or more meters measuring incoming water is slow. In 2017, there were three wholesale customers with non-revenue water suggestive of metering issues. Bothell and Tukwila both had non-revenue water very close to zero while Kirkland's non-revenue water was *negative* 9.6% (!).

Per Household and Per Account Consumption: Figures 2.5 and 2.6 rank wholesale customers and Seattle on the basis of 2017 *single family* consumption *per household* and *total* consumption *per account*. The first measure is often used by wholesale customers in their analysis of current and projected water demand and in their calculation of Equivalent Residential Units (ERUs). The wholesale customer with the highest single family consumption per household is Kirkland at 229 gallons per day (gpd), followed by Sammamish Plateau at 218 gpd and Woodinville at 205 gpd. The weighted wholesale average for 2017 was 180 gpd (7.3 ccf per month). Skyway reported the lowest consumption per household with 127 gpd. The variance in per household use between wholesale customers is due to more than just different attitudes towards water conservation. Wholesale customers at the top of the list (Kirkland, Sammamish Plateau, Woodinville, Mercer Island, etc.) tend to have some or all of the following characteristics associated with higher water use: larger lot sizes, higher household incomes, and higher average persons per household. Utilities (including Seattle) with consumption per household at the low end of the scale tend to have just the opposite characteristics: denser development with smaller lots, lower average household incomes, and fewer persons per household. In addition to annual average consumption per single family household, Figure 2.5 also shows peak (4 month) season consumption per household.

There is much greater variation in total consumption per account across wholesale customers as can be seen in Figure 2.6. The weighted wholesale average is 322 gpd. Total consumption per account in Seattle is 293 gpd, a bit less than the wholesale average. This is *not* an indication of the relative efficiency of water use among the different utilities. Rather, higher levels of total consumption per account are closely associated with higher proportions of non-residential and multifamily customers. Wholesale customers at the bottom of the list serve predominantly single family customers. Utilities at the top of the list with the highest consumption per account – Tukwila, Redmond, Bellevue, Bothell, Renton, and Water District 125 – also have the highest proportions of non-residential and multifamily consumption, (50% or more of the total – Tukwila is 90%). Total consumption per account and percent of consumption that is *not* single family are highly correlated all the way down the line.

Finally, Table 2.4 provides some history on single family consumption per household by wholesale customer for the period 1994-2017. The overall downward trend in average consumption per household for both wholesale customers and Seattle is apparent in Figure 2.7. The average decline since 1994 has been over 30%. The range, from low to high, of wholesale consumption per household over time is also depicted in the graph. Like Figure 2.3, this graphically illustrates the impact on single family residential water demand of conservation programs, water efficiency codes for new fixtures and appliances, and rising water and sewer rates.

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Table 1.1 A Comparison of 2018 Residential Rates

	BSC for ¾" Mtr	Season	Block Thresholds** in CCF per Month																											Block Thresholds	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	...	50		...
W.D. 20	\$21.25	-	\$2.25				\$2.87										\$3.42														5/15
W.D. 45	\$18.50	-	\$4.75				\$5.75								\$6.75																5/12.5
W.D. 49	\$18.61	-	\$3.58				\$4.41			\$4.41																					5/8
W.D. 90	\$27.08	Off-Peak Peak	\$0		\$3.20			\$3.65						\$4.35																	7.5/12.5
W.D. 119*	\$42.00	Off-Peak Peak	\$2.46		\$3.49			\$4.30						\$5.22																	3.5/7/14
W.D. 125	\$14.20	-	\$3.55				\$4.20																								6
Bellevue ^T	\$26.04	-	\$4.09				\$5.19			\$6.81															\$9.72						5.5/8.5/22.5
Bothell ^T	\$15.56	-	\$3.06				\$4.49			\$5.79				\$7.37													\$8.42				5/10/15/25
Cedar River	\$17.34	-	\$0	\$2.64			\$4.59							\$5.34													\$8.05				5/15/25
Coal Creek	\$21.53	-	\$3.55				\$4.61							\$5.89														\$8.45			5/15/50
Duvall	\$27.18	-	\$0	\$4.05	\$5.20	\$6.37	\$7.52	\$8.70																							4/6/8/10
Highline	\$15.15	Off-Peak Peak	\$3.73				\$4.42																								- 5
Issaquah ^T	\$15.38	-	\$1.99	\$4.73			\$8.79							\$14.31														\$20.57			2/7/15/25
Kirkland ^T	\$23.08	-	\$0	\$5.53									\$7.28																		12
Mercer Island ^T	\$17.57	Off-Peak Peak	\$4.17				\$7.05						\$8.47				\$11.38														5/10/15
North City ^{S,T}	\$30.27	-	\$3.18				\$4.89						\$6.57																		5/12
Northshore ^T	\$16.43	-	\$3.75				\$4.84						\$5.93																		5/10
Olympic View ^T	\$21.56	Off-Peak Peak	\$2.32																					\$3.41							20
Redmond	\$14.85	-	\$1.82			\$3.64							\$5.46											\$7.28							4/10/20
Renton	\$17.60	-	\$2.54				\$3.41						\$4.30																		5/10
Sammamish Plateau	\$29.75	-	\$1.95				\$2.37							\$3.84													\$6.39				6/12/25
Skyway	\$19.24	-	\$4.27			\$5.41	\$6.32							\$8.69																	4/6/12
Soos Creek	\$14.73	Off-Peak Peak	\$1.86				\$3.80						\$4.76				\$5.38														5/10/15
Tukwila	\$18.00	Off-Peak Peak	\$2.80				\$3.90																								-
Woodinville	\$21.30	Off-Peak Peak	\$0	\$4.93										\$7.46																	12.5
Seattle	\$16.10	Off-Peak Peak	\$5.20																												- 5/18
Block Thresholds in CCF per Month			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	...	50	...	

Blocks: \$0 CCF included with Base Service Charge (BSC) at no additional charge

1st Block

2nd Block

3rd Block

4th Block

5th Block

* All utilities with seasonal rates use a 4 month peak season except Water District 119 (6 month).

** Block thresholds are the number of ccf per month at which the next rate block is attained. For example, W.D. 45 charges \$4.75 per ccf for the first 5 ccf consumed, \$5.75 per ccf for the next 7.5 ccf per month, and \$6.75 per ccf for all consumption in excess of 12.5 ccf per month.

^S Base Service Charge for North City is based on both meter size and the square footage of buildings so there is no single charge that applies to all customers with a 2" meter. The charge shown in the table is the minimum charge and applies to residences with less than 1680 square feet. Larger houses pay more. The monthly charge for a 3,000 square foot home would be \$38.36.

^T Taxes and fees not included in the published rates of these utilities (Bellevue, Bothell, Issaquah, Kirkland, Mercer Island, North City, Northshore, and Olympic View) have been added to the rates shown in this table.

**Table 1.2
A Comparison of 2018 Commercial Rates**

	BSC for 2" Mtr	Season	Block Thresholds in CCF per Month																Block Thresholds										
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	...		25	...	32	...	40	...	80	...	160	...
W.D. 20	\$106.25	-	\$2.25				\$2.87										\$3.42												5/15
W.D. 45	\$18.50	-	\$4.75				\$5.75										\$6.75												5/12.5
W.D. 49	\$244.90	-	\$4.13																										-
W.D. 90	\$70.00	-	\$0		\$4.35																								-
W.D. 119*	\$74.00	Off-Peak	\$2.46			\$3.49			\$4.30								\$5.22												3.5/7/14
		Peak	\$3.86			\$4.86			\$6.37								\$7.73												
W.D. 125	\$50.00	Off-Peak	\$3.69																										-
		Peak	\$4.04																										
Bellevue ^T	\$119.82	Off-Peak	\$5.15																										-
		Peak	\$7.05																										
Bothell ^T	\$122.56	Off-Peak	\$3.44																										-
		Peak	\$5.88																										
Cedar River	\$67.87	-	\$0	\$2.64		\$4.59											\$5.34		\$8.05									5/15/25	
Coal Creek	\$114.52	Off-Peak	\$4.09																										-
		Peak	\$5.33																										
Duvall	\$27.18	-	\$0	\$4.05	\$5.20	\$6.37	\$7.52	\$8.70																				4/6/8/10	
Highline	\$132.92	Off-Peak	\$3.73																										-
		Peak	\$3.73		\$4.42																								5
Issaquah ^T	\$137.24	-	\$4.00																	\$6.17								32	
Kirkland ^T	\$80.58	-	\$5.56																									-	
Mercer Island ^T	\$140.53	Off-Peak	\$3.83																										-
		Peak	\$9.54																										
North City ^{S,T}	\$142.43	-	\$4.62																									-	
Northshore ^T	\$120.55	-	\$4.03																					\$4.30	\$4.57			40/80	
Olympic View ^T	\$78.43	Off-Peak	\$2.32																								\$3.40	160	
		Peak	\$2.59																								\$4.07		
Redmond	\$90.30	Off-Peak	\$2.39																										-
		Peak	\$4.09																										
Renton	\$105.52	-	\$3.48																										-
Sammamish Plateau	\$189.02	Off-Peak	\$1.57																										-
		Peak	\$2.31																										
Skyway	\$219.60	-	\$6.16																										0
Soos Creek	\$58.56	Off-Peak	\$1.86			\$3.80			\$4.76								\$5.38												5/10/15
		Peak	\$4.56			\$4.56			\$5.71							\$6.46													
Tukwila	\$105.00	Off-Peak	\$5.10																										-
		Peak	\$6.90																										
Woodinville	\$172.00	-	\$0	\$4.56																									Prior Winter Average
Seattle	\$28.35	Off-Peak	\$5.20																										-
		Peak	\$6.59																										
Block Thresholds in CCF per Month			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	...	25	...	32	...	40	...	80	...	160	...	

Blocks: \$0 CCF included with Base Service Charge (BSC) at no additional charge

\$0 1st Block \$0 2nd Block \$0 3rd Block \$0 4th Block \$0 5th Block

* All utilities with seasonal rates use a 4 month peak season except Water District 119 (6 month).

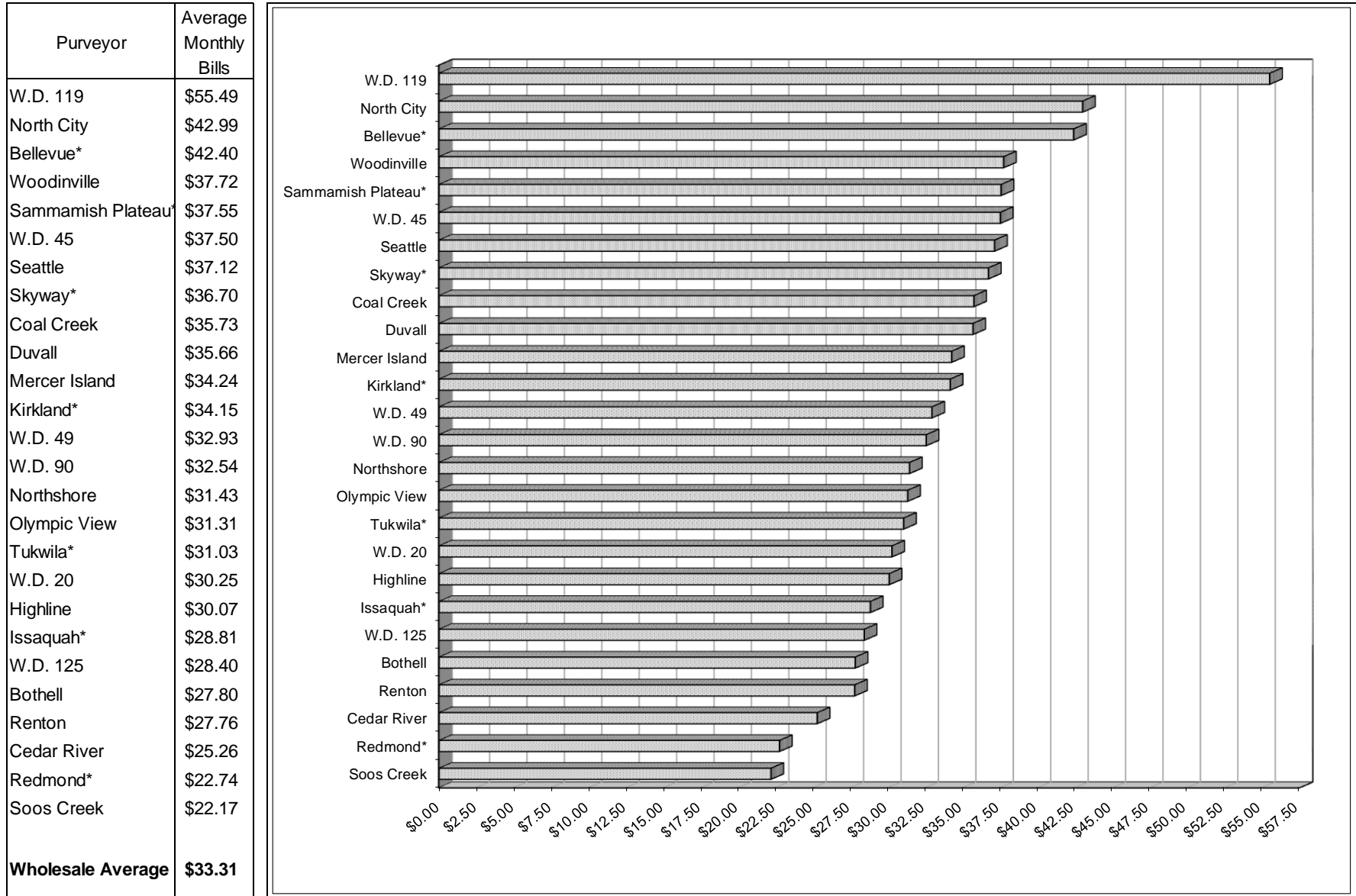
** Block thresholds are the number of ccf per month at which the next rate block is attained. For example, W.D. 45 charges \$4.75 per ccf for the first 5 ccf consumed, \$5.75 per ccf for the next 7.5 ccf per month, and \$6.75 per ccf for all consumption in excess of 12.5 ccf per month.

^S Base Service Charge for North City is based on both meter size and the square footage of buildings so there is no single charge that applies to all customers with a 2" meter. The charge shown in the table is the minimum charge and applies to buildings with less than 1680 square feet. Larger buildings pay more. The monthly charge for a 30,000 square foot building would be \$279.92.

^T Taxes and fees not included in the published rates of these utilities (Bellevue, Bothell, Issaquah, Kirkland, Mercer Island, North City, Northshore, and Olympic View) have been added to the rates shown in the table.

Figure 1.1

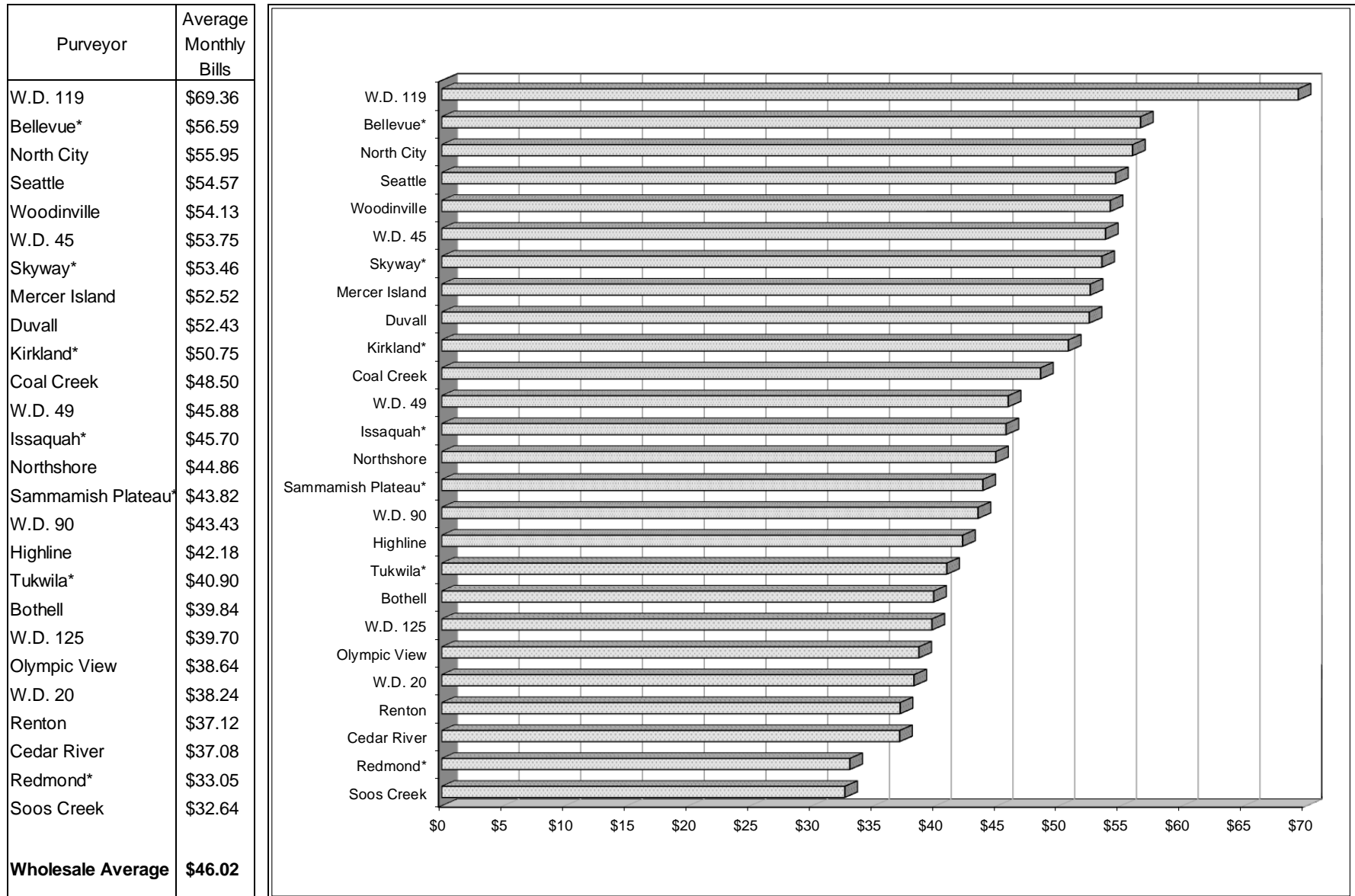
Average Monthly Residential Bills at 2018 Rates and LOW Consumption (3.5ccf/mo Winter and 5 ccf/mo Summer Consumption)



* Member of Cascade Water Alliance

Figure 1.2

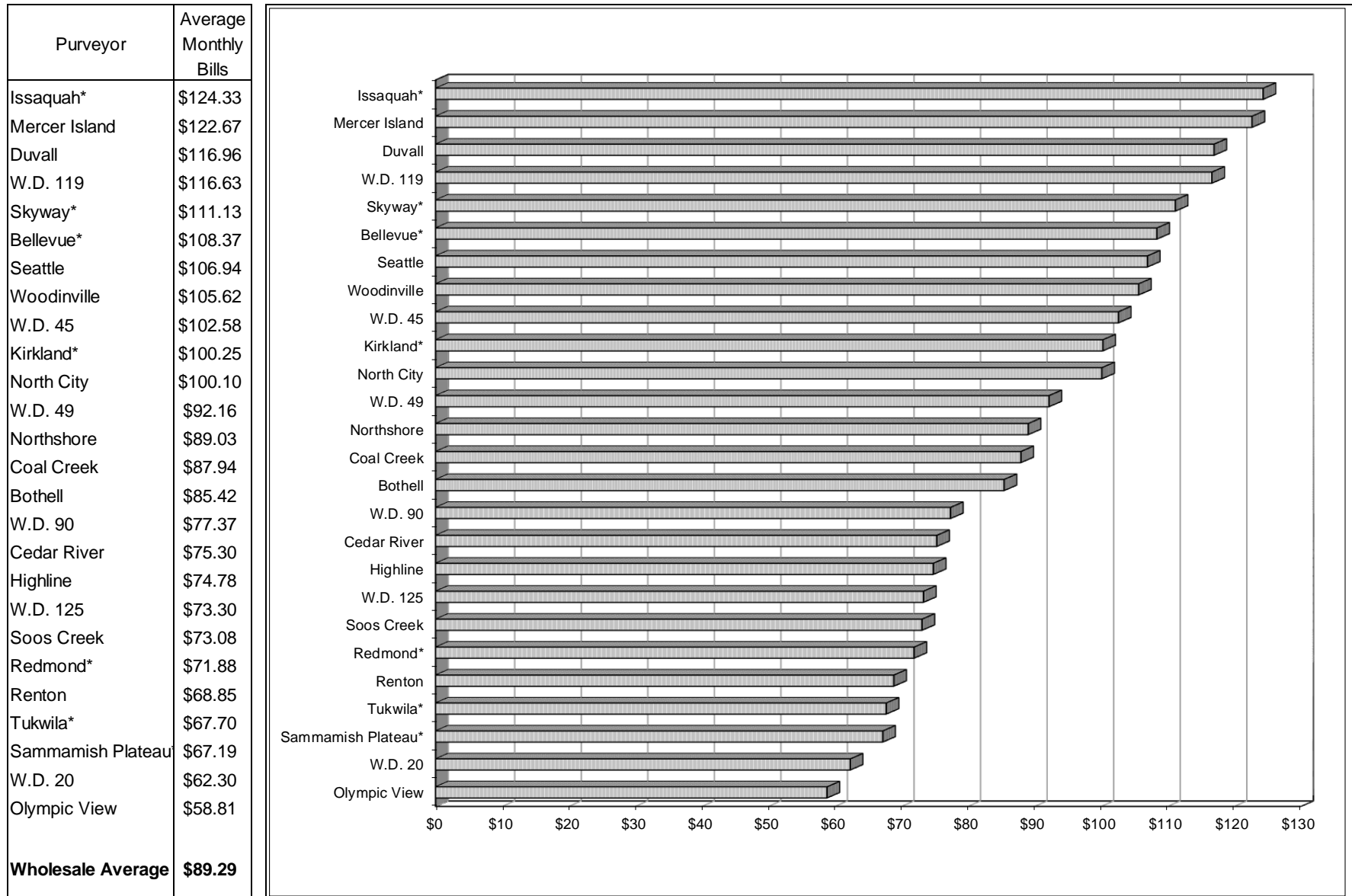
Average Monthly Residential Bills at 2018 Rates and MEDIUM Consumption (6 ccf/mo Winter and 9 ccf/mo Summer Consumption)



* Member of Cascade Water Alliance

Figure 1.3

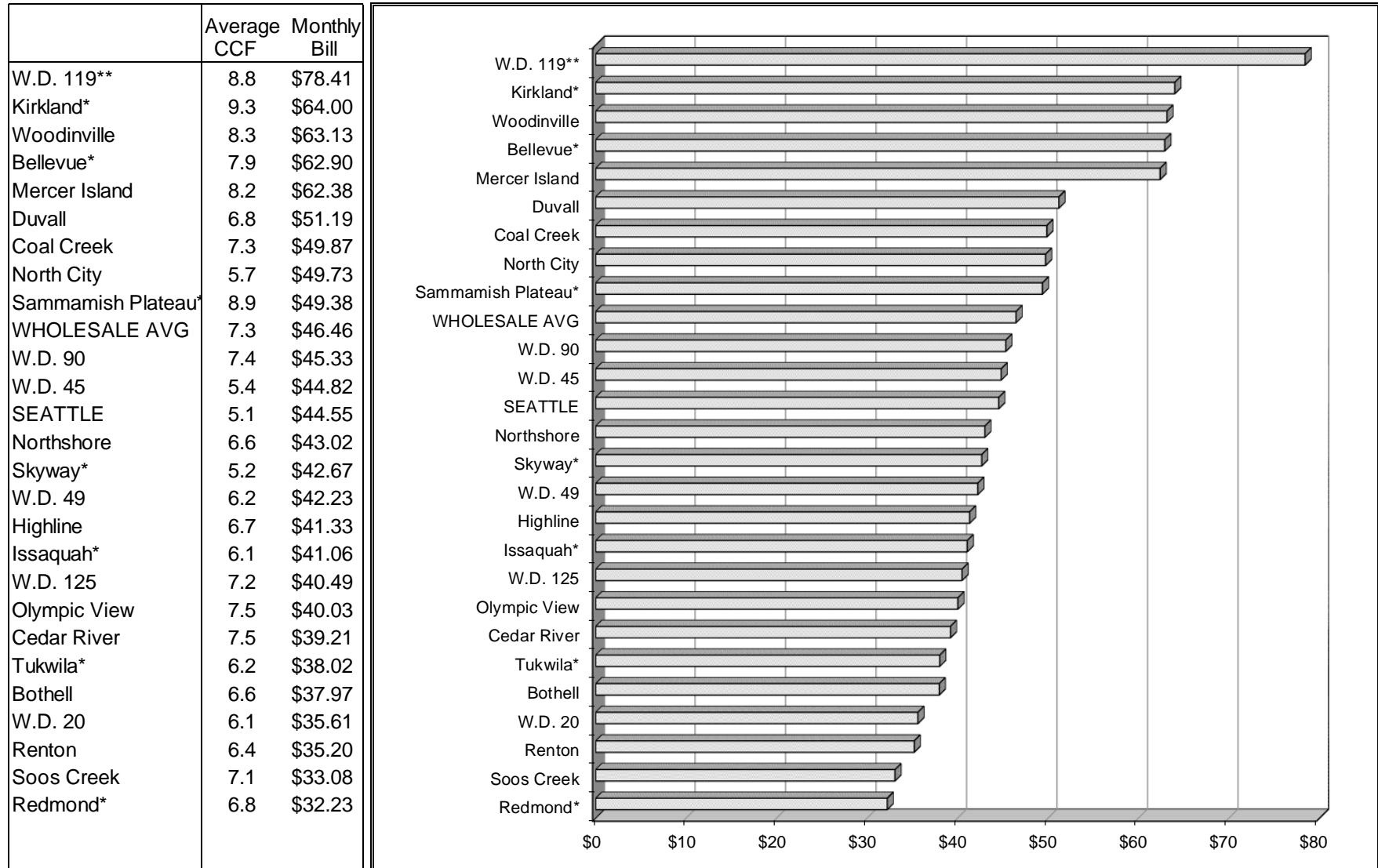
Average Monthly Residential Bills at 2018 Rates and HIGH Consumption (12 ccf/mo Winter and 21 ccf/mo Summer Consumption)



* Member of Cascade Water Alliance

Figure 1.4

Average Monthly Residential Water Bills at Each Utility's Average Consumption



* Member of Cascade Water Alliance

** WD 119 has not submitted consumption data since 2015. It's average monthly residential bill is therefore calculated by applying its 2018 rates to its 2015 average residential consumption.

Table 1.3

AVERAGE ANNUAL, WINTER, AND SUMMER RESIDENTIAL BILLS
with 2017 Rates & Medium Consumption: 6 ccf/mo Winter, 9 ccf/mo Summer
Ranked from Highest to Lowest

Rank	Purveyor	Monthly Residential Bills			Summer/Winter Differential**
		Avg. Annual	Winter	Summer	
1	W.D. 119	\$69.36	\$59.34	\$85.26	43.7%
2	Bellevue*	\$56.59	\$51.13	\$67.51	32.0%
3	North City	\$55.95	\$51.06	\$65.72	28.7%
4	Seattle	\$54.57	\$47.30	\$69.11	46.1%
5	Woodinville	\$54.13	\$45.95	\$70.50	53.4%
6	W.D. 45	\$53.75	\$48.00	\$65.25	35.9%
7	Skyway*	\$53.46	\$47.14	\$66.10	40.2%
8	Mercer Island	\$52.52	\$45.46	\$66.62	46.5%
9	Duvall	\$52.43	\$45.68	\$65.94	44.4%
10	Kirkland*	\$50.75	\$45.22	\$61.81	36.7%
11	Coal Creek	\$48.50	\$43.89	\$57.72	31.5%
12	W.D. 49	\$45.88	\$40.92	\$55.80	36.4%
13	Issaquah*	\$45.70	\$38.26	\$60.56	58.3%
14	Northshore	\$44.86	\$40.02	\$54.54	36.3%
15	Sammamish Plateau*	\$43.82	\$41.45	\$48.56	17.2%
16	W.D. 90	\$43.43	\$38.28	\$53.75	40.4%
17	Highline	\$42.18	\$37.53	\$51.48	37.2%
18	Tukwila*	\$40.90	\$34.80	\$53.10	52.6%
19	Bothell	\$39.84	\$35.35	\$48.82	38.1%
20	W.D. 125	\$39.70	\$35.50	\$48.10	35.5%
21	Olympic View	\$38.64	\$35.48	\$44.96	26.7%
22	W.D. 20	\$38.24	\$35.37	\$43.98	24.3%
23	Renton	\$37.12	\$33.71	\$43.94	30.3%
24	Cedar River	\$37.08	\$32.49	\$46.26	42.4%
25	Redmond*	\$33.05	\$29.41	\$40.33	37.1%
26	Soos Creek	\$32.64	\$27.83	\$42.27	51.9%
WHOLESALE AVERAGE					
		\$46.02	\$40.77	\$56.36	38.2%

* Member of Cascade Water Alliance

** Note that the summer/winter differential is not the differential in rates but in bills. Almost all utilities have a differential of less than 50% even though bills are calculated with 50% more consumption in summer than in winter. This means that the average rate charged per ccf by these utilities is actually less in the summer than in the winter. This seemingly contradictory result is due to the impact of the meter charge which is spread over a greater number of ccf in the summer.

Table 1.4

Ranking of Purveyor Bills from High to Low at Different Levels of Consumption

Ranking at Low Consumption	Ranking at Medium Consumption	Ranking at High Consumption
1 W.D. 119	1 W.D. 119	1 Issaquah*
2 North City	2 Bellevue*	2 Mercer Island
3 Bellevue*	3 North City	3 Duvall
4 Woodinville	4 Seattle	4 W.D. 119
5 Sammamish Plateau*	5 Woodinville	5 Skyway*
6 W.D. 45	6 W.D. 45	6 Bellevue*
7 Seattle	7 Skyway*	7 Seattle
8 Skyway*	8 Mercer Island	8 Woodinville
9 Coal Creek	9 Duvall	9 W.D. 45
10 Duvall	10 Kirkland*	10 Kirkland*
11 Mercer Island	11 Coal Creek	11 North City
12 Kirkland*	12 W.D. 49	12 W.D. 49
13 W.D. 49	13 Issaquah*	13 Northshore
14 W.D. 90	14 Northshore	14 Coal Creek
15 Northshore	15 Sammamish Plateau*	15 Bothell
16 Olympic View	16 W.D. 90	16 W.D. 90
17 Tukwila*	17 Highline	17 Cedar River
18 W.D. 20	18 Tukwila*	18 Highline
19 Highline	19 Bothell	19 W.D. 125
20 Issaquah*	20 W.D. 125	20 Soos Creek
21 W.D. 125	21 Olympic View	21 Redmond*
22 Bothell	22 W.D. 20	22 Renton
23 Renton	23 Renton	23 Tukwila*
24 Cedar River	24 Cedar River	24 Sammamish Plateau*
25 Redmond*	25 Redmond*	25 W.D. 20
26 Soos Creek	26 Soos Creek	26 Olympic View

Definition of Consumption Levels:**

	Winter	Summer	Average
Low	3.5 ccf/mo	5 ccf/mo	4 ccf/mo
Medium	6 ccf/mo	9 ccf/mo	7 ccf/mo
High	12 ccf/mo	21 ccf/mo	15 ccf/mo

* Member of Cascade Water Alliance

** Note that consumption levels have been revised downwards to reflect the long term decline in average consumption per single family household from 9.3 ccf/mo in the mid-1990s to about 7.0 ccf/mo currently.

Figure 1.5

Average Annual Rates of Growth in Residential Water Bills: 1995-2018 Calculated at Each Utility's Average Consumption and Adjusted for Inflation

	Percent Bill Increase	
	1995-2018	Avg Annual
Bellevue*	103%	3.1%
Kirkland*	97%	3.0%
SEATTLE	88%	2.8%
Mercer Island	83%	2.7%
W.D. 119**	63%	2.1%
W.D. 125	45%	1.6%
Woodinville	41%	1.5%
North City	40%	1.5%
Tukwila*	38%	1.4%
Northshore	38%	1.4%
Bothell	33%	1.2%
W.D. 49	31%	1.2%
WHOLESALE AVG	28%	1.1%
Coal Creek	25%	1.0%
W.D. 90	15%	0.6%
Redmond*	14%	0.6%
Duvall	12%	0.5%
W.D. 45	11%	0.4%
Skyway*	10%	0.4%
Highline	8%	0.3%
Soos Creek	6%	0.3%
W.D. 20	-5%	-0.2%
Olympic View	-6%	-0.3%
Cedar River	-6%	-0.3%

* Member of Cascade Water Alliance
Utilities that have not been SPU wholesale customers the entire 1995-2018 period are not included.

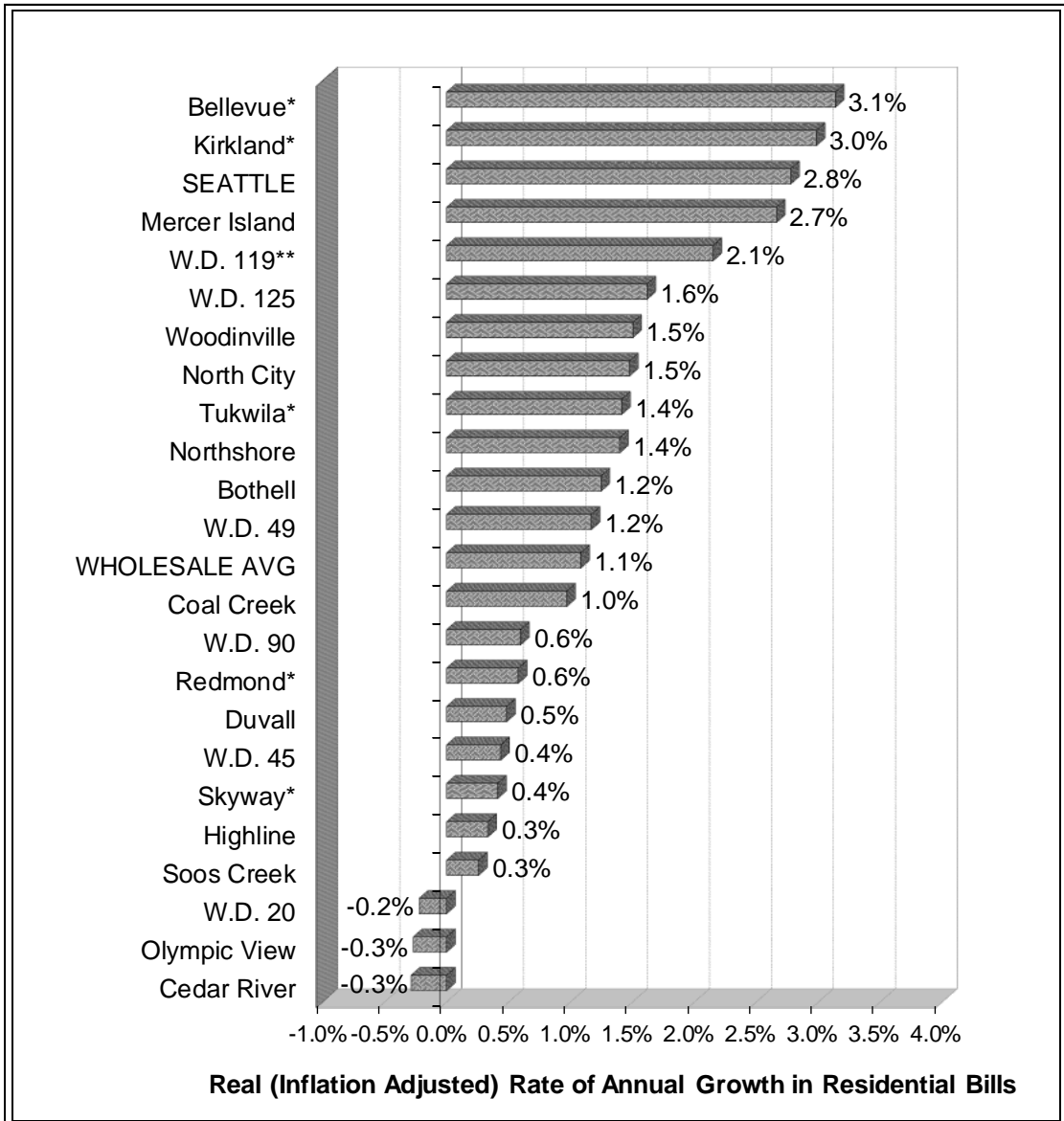


Figure 2.1
WHOLESALE CUSTOMERS RANKED BY 2017 ANNUAL DIRECT PURCHASES FROM SPU

Wholesale Customer	Purchases
Bellevue*	9,226,813
Kirkland*	2,953,527
Northshore	2,552,095
Highline	2,284,771
Soos Creek	2,013,964
Woodinville	1,903,717
W.D. 20	1,177,081
Mercer Island	1,049,915
Tukwila*	929,710
Cedar River	898,592
North City	797,314
Bothell	734,017
W.D. 90	628,548
W.D. 49	602,751
Coal Creek	600,015
Redmond*	564,176
W.D. 125	553,383
Olympic View	428,901
Duvall	260,769
Skyway*	162,762
W.D. 119	129,592
W.D. 45	112,601
Renton	56,131
TOTAL	30,621,145

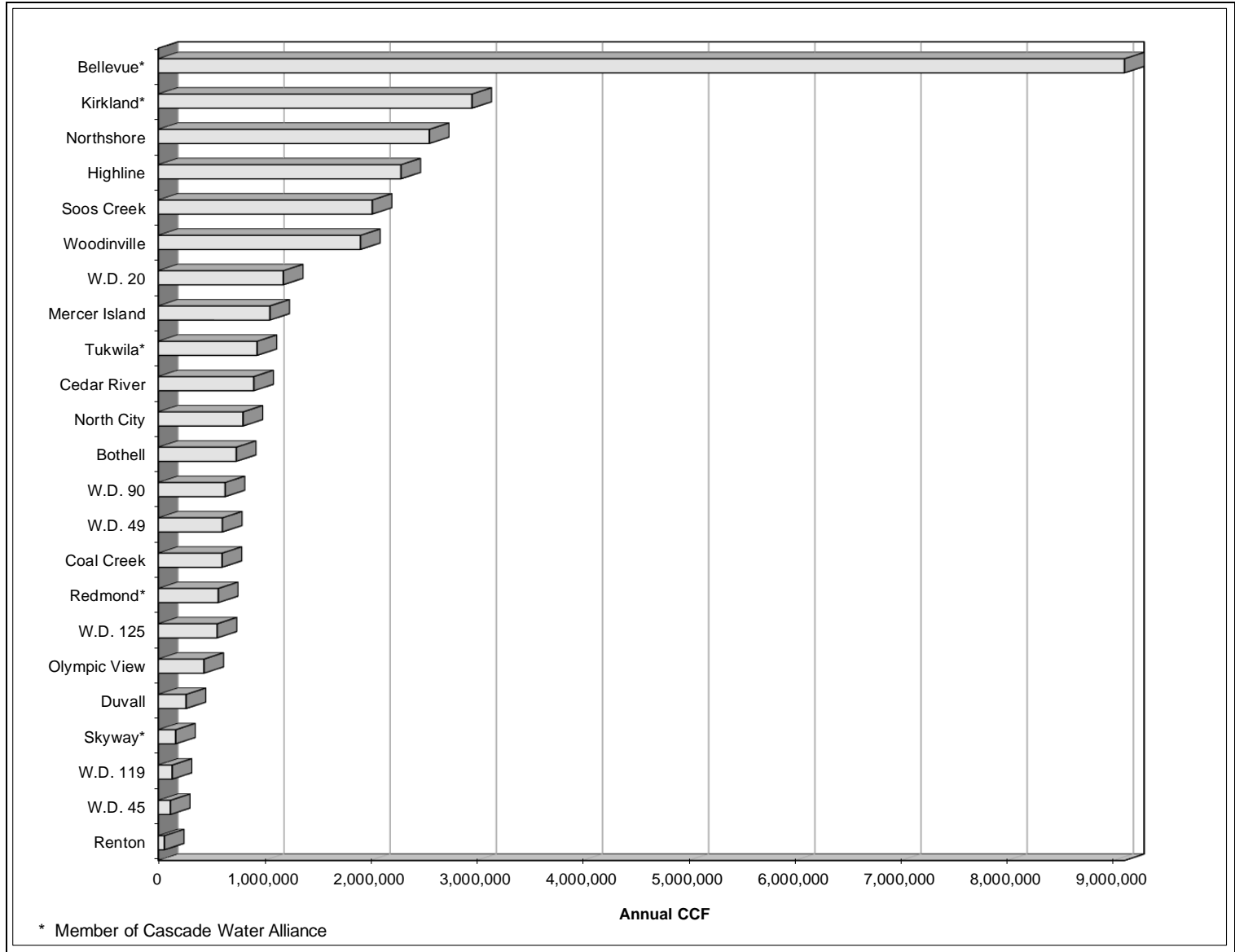


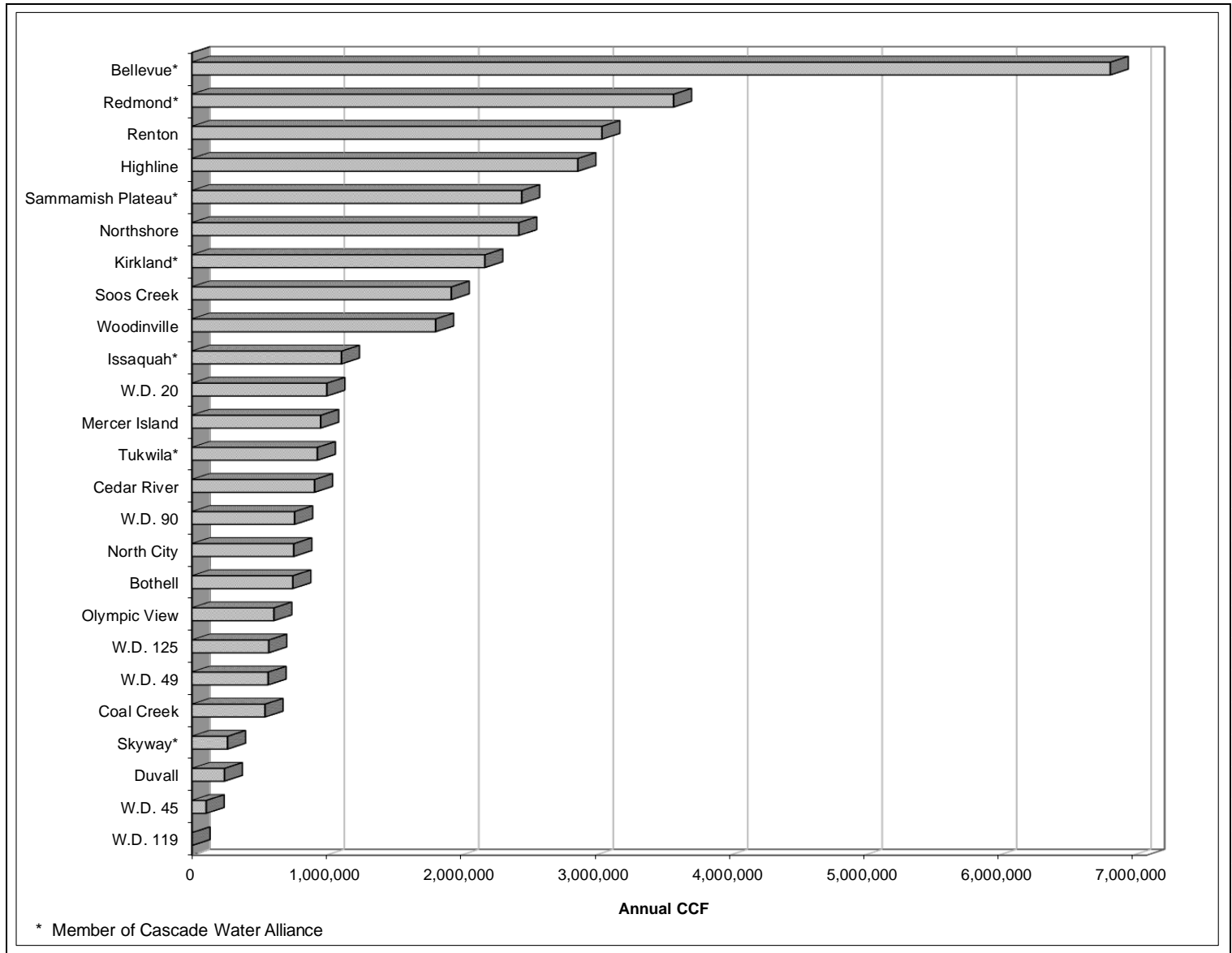
Table 2.1
Annual Direct Water Purchases from SPU by Wholesale Customer in CCF: 2004-2017

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Bellevue*	8,525,078	7,864,907	8,474,731	8,336,308	8,314,028	8,573,043	7,714,349	7,912,285	8,440,512	8,671,870	8,468,924	9,056,491	8,872,628	9,226,813
Bothell	790,903	710,804	791,591	745,144	725,123	732,256	640,359	637,415	656,581	670,069	751,608	724,782	708,236	734,017
Cedar River	989,535	985,386	1,071,615	947,745	872,814	924,524	800,755	758,691	701,387	809,005	827,277	910,094	853,281	898,592
Coal Creek	607,964	525,361	598,753	526,420	516,395	597,952	485,859	493,533	525,773	521,259	555,475	602,575	595,446	600,015
Duvall	244,321	236,868	242,851	230,852	222,695	253,521	224,298	233,390	232,947	235,508	243,416	260,014	249,931	260,769
Highline	2,964,590	2,559,715	2,565,923	2,517,632	2,473,927	2,351,174	2,143,580	2,126,929	2,105,391	1,900,457	2,159,022	2,401,204	2,331,523	2,284,771
Kirkland*	3,044,835	2,833,027	3,150,078	2,954,510	2,980,975	3,009,442	2,670,036	2,660,037	2,658,078	2,664,624	2,834,762	3,008,403	2,849,305	2,953,527
Mercer Island	1,219,866	1,072,336	1,139,931	1,087,304	1,039,660	1,032,966	855,678	924,062	992,386	1,003,892	1,041,934	1,080,492	1,060,012	1,049,915
North City	936,967	866,334	917,711	871,042	850,414	860,299	771,973	650,376	669,971	838,799	848,588	831,093	807,225	797,314
Northshore	2,838,343	2,556,349	2,698,337	2,555,901	2,441,109	2,574,352	2,394,673	2,463,963	2,451,174	2,486,656	2,541,588	2,623,056	2,526,863	2,552,095
Olympic View	462,990	414,859	549,538	406,617	406,802	496,479	361,712	348,497	374,499	385,411	402,010	427,550	428,769	428,901
Redmond*	461,140	471,211	668,574	452,805	504,742	1,242,852	499,676	705,173	652,641	473,834	474,702	553,274	389,216	564,176
Renton	64,549	51,841	48,314	51,959	38,125	42,490	59,904	88,749	51,086	43,815	47,775	54,951	47,067	56,131
Skyway*	235,574	226,417	212,135	201,841	177,990	185,047	165,814	174,797	146,535	157,344	167,003	172,648	163,683	162,762
Soos Creek	2,336,428	2,126,144	2,205,083	2,126,508	1,981,264	2,119,629	1,873,183	2,008,295	1,945,924	1,922,452	1,949,246	2,002,945	1,963,028	2,013,964
Tukwila*	1,136,059	1,069,148	1,068,642	1,060,170	993,747	986,705	920,469	942,999	943,018	952,619	967,875	1,001,737	961,845	929,710
Woodinville	2,243,238	1,873,605	2,032,328	1,996,289	1,956,618	2,184,773	1,781,785	1,759,518	1,740,966	1,915,528	1,922,760	1,987,587	1,830,139	1,903,717
W.D. 20	1,346,869	1,325,298	1,416,165	1,339,902	1,358,086	1,386,645	1,237,668	1,233,990	1,215,151	1,245,419	1,264,750	1,240,865	1,172,367	1,177,081
W.D. 45	127,217	116,943	105,832	95,913	94,013	95,912	100,229	106,783	107,679	111,838	112,930	113,495	110,107	112,601
W.D. 49	640,512	587,490	599,956	636,898	585,791	589,113	556,683	638,260	610,235	562,840	606,746	625,497	631,025	602,751
W.D. 90	503,774	452,581	539,675	542,270	550,935	521,397	433,468	493,819	536,673	540,180	594,651	621,453	592,318	628,548
W.D. 119	133,744	126,416	131,697	121,176	117,871	132,998	115,579	110,073	111,287	108,192	150,749	122,240	111,629	129,592
W.D. 125	646,969	603,604	623,262	597,401	549,107	587,539	514,478	495,650	495,315	481,332	458,505	495,718	533,392	553,383
Total	32,501,465	29,656,646	31,852,728	30,402,609	29,752,240	31,481,128	27,322,218	27,967,343	28,365,209	28,702,943	29,392,493	30,918,362	29,789,035	30,621,145

* Members of Cascade Water Alliance. Water shown as "purchased" by individual Cascade members reflects consumption measured through their meters with SPU. However, individual Cascade members are not billed directly by SPU.

Figure 2.2
WHOLESALE CUSTOMERS RANKED BY 2017 ANNUAL RETAIL BILLED SALES

Wholesale Customer	Retail Sales
Bellevue*	6,828,709
Redmond*	3,581,110
Renton	3,048,079
Highline	2,868,973
Sammamish Plateau*	2,451,686
Northshore	2,430,100
Kirkland*	2,177,462
Soos Creek	1,927,781
Woodinville	1,811,486
Issaquah*	1,111,339
W.D. 20	1,002,558
Mercer Island	956,501
Tukwila*	932,099
Cedar River	911,155
W.D. 90	762,857
North City	756,651
Bothell	749,566
Olympic View	608,778
W.D. 125	570,541
W.D. 49	566,205
Coal Creek	542,719
Skyway*	263,956
Duvall	240,887
W.D. 45	105,375
W.D. 119	NA**
TOTAL**	37,206,573



** Water District 119 did not provide retail billed consumption data for 2017. Total excludes Water District 119.

Table 2.2
Annual Retail Water Sales by Wholesale Customer in CCF: 2004-2017

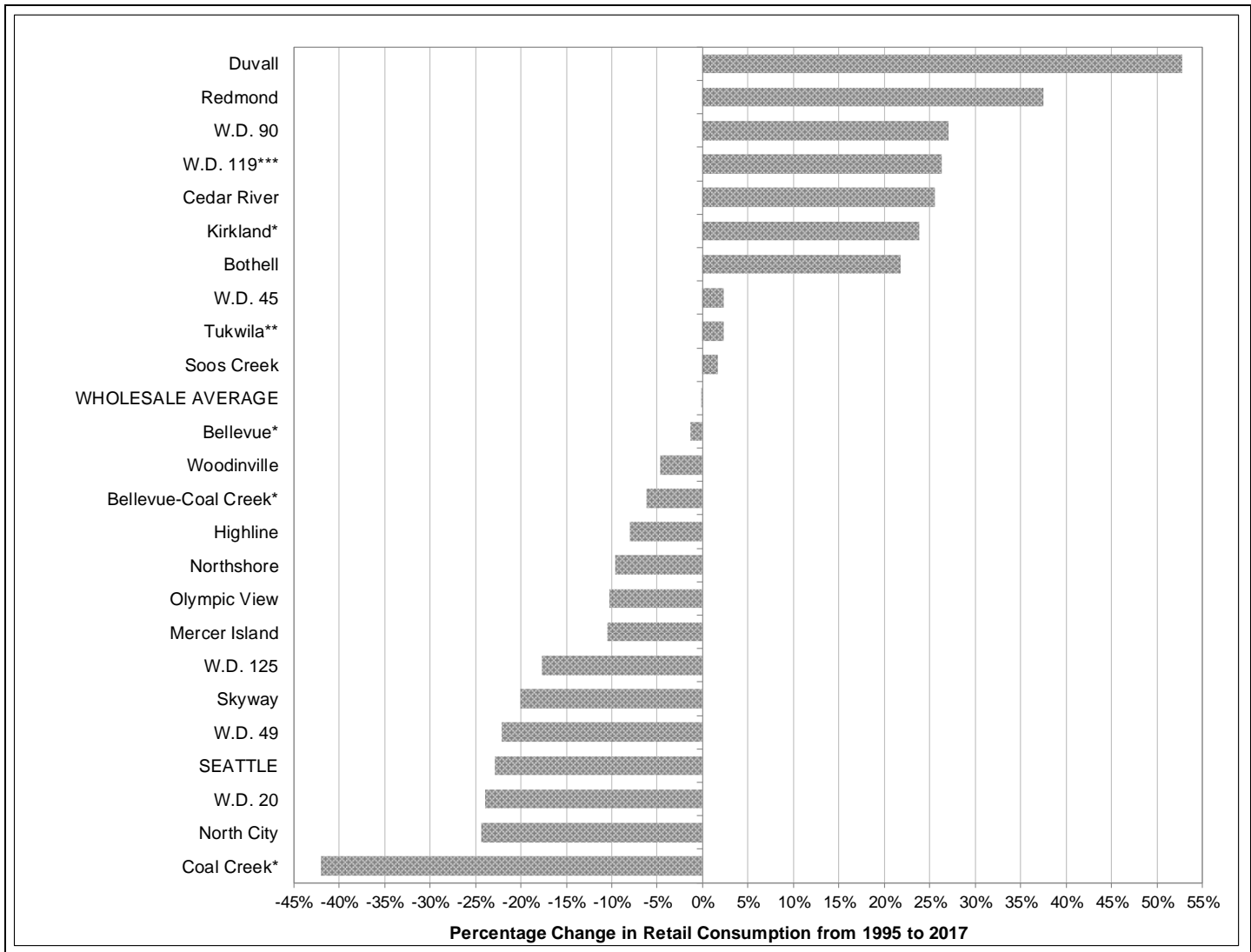
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Bellevue*	7,078,453	6,783,981	No Data	6,851,810	6,612,399	6,908,439	6,276,954	No Data	6,652,102	6,622,564	6,776,081	7,068,290	6,853,901	6,828,709
Bothell*	No Data	577,806	656,619	693,484	711,427	726,962	681,145	627,483	645,746	663,539	715,943	738,030	756,659	749,566
Cedar River	925,955	855,114	964,037	904,362	855,210	941,306	816,633	791,574	845,321	837,278	856,402	920,373	867,483	911,155
Coal Creek	543,762	488,466	563,705	491,502	473,088	554,686	439,423	443,453	479,094	472,781	491,909	560,980	502,896	542,719
Duvall	218,230	205,341	223,653	220,032	216,704	239,872	200,987	215,895	216,172	213,225	229,374	228,157	231,285	240,887
Highline	3,149,274	3,029,761	3,066,659	2,976,073	2,840,910	2,920,652	2,661,812	2,644,611	2,659,258	2,703,065	2,779,089	2,847,534	2,850,950	2,868,973
Issaquah*	No Data	No Data	No Data	No Data	806,842	892,875	809,031	821,652	881,251	872,886	984,285	973,085	937,721	1,111,339
Kirkland*	1,739,111	1,833,509	1,843,186	1,729,375	1,657,408	1,801,406	1,574,869	No Data	1,566,695	1,698,294	1,773,444	1,804,311	1,746,056	2,177,462
Mercer Island	1,155,137	984,570	996,235	978,013	931,806	1,000,468	866,165	891,529	897,230	900,575	966,483	959,114	930,888	956,501
North City	886,232	815,594	849,559	813,161	856,562	843,675	746,571	709,027	731,780	746,917	754,150	750,242	754,789	756,651
Northshore*	2,676,062	No Data	2,630,374	2,501,954	2,394,514	2,512,510	2,334,511	2,266,068	2,362,615	2,427,789	2,452,293	2,505,023	2,384,959	2,430,100
Olympic View	699,541	627,376	659,836	612,943	600,568	683,135	585,617	575,861	558,421	586,950	603,319	618,309	597,300	608,778
Redmond*	No Data	No Data	No Data	No Data	3,085,835	3,165,854	2,969,511	2,832,871	2,996,495	3,005,475	3,105,651	2,967,794	3,288,969	3,581,110
Renton*	No Data	No Data	No Data	3,083,313	2,900,725	3,035,983	2,789,845	2,830,862	2,955,165	2,867,155	2,859,392	3,007,726	2,940,561	3,048,079
Sammamish Plateau*	No Data	No Data	No Data	No Data	2,113,475	2,310,814	1,976,398	1,984,468	2,070,994	2,053,303	2,150,767	2,386,234	2,260,752	2,451,686
Skyway	309,832	280,643	292,983	285,914	275,432	277,182	257,760	257,921	252,642	252,760	268,745	273,221	257,206	263,956
Soos Creek	2,023,063	1,870,978	2,003,456	1,972,069	1,832,233	1,903,844	1,693,450	1,737,069	1,867,566	1,861,518	1,896,792	1,903,748	1,899,834	1,927,781
Tukwila*	1,000,684	1,043,575	No Data	918,957	883,576	888,759	843,254	836,866	869,865	884,564	914,889	932,015	876,305	932,099
Woodinville	2,077,734	1,867,062	2,044,244	1,884,117	1,789,966	1,987,478	1,679,587	1,696,919	1,724,180	1,739,578	1,848,832	1,897,607	1,717,238	1,811,486
W.D. 20	1,200,605	1,144,053	1,196,913	1,141,240	1,099,170	1,115,278	1,034,602	1,005,816	1,013,874	994,177	1,035,187	1,029,163	1,028,520	1,002,558
W.D. 45	121,307	108,416	99,325	90,092	89,336	90,799	97,857	100,065	105,855	104,627	107,942	111,737	104,755	105,375
W.D. 49	610,845	616,020	620,546	602,572	576,403	586,525	549,063	548,355	548,241	537,628	558,191	572,646	567,597	566,205
W.D. 90	665,985	602,173	694,640	664,617	652,558	720,856	634,419	638,859	667,072	694,406	706,094	764,579	709,933	762,857
W.D. 119*	113,288	105,277	126,326	109,394	109,449	116,871	102,606	No Data	113,957	112,750	No Data	127,510	No Data	No Data
W.D. 125	652,703	611,276	636,882	637,662	616,905	654,841	574,180	559,617	570,319	555,828	573,455	582,314	571,481	570,541
TOTAL*	M I S S I N G D A T A				34,982,501	36,881,070	33,196,250	Missing Data	34,251,910	34,409,632	Missing Data	36,529,742	Missing Data	Missing Data
Seattle	29,994,131	28,340,298	29,114,620	28,490,213	27,538,310	28,015,569	26,561,023	25,824,242	26,279,721	26,429,190	26,190,327	27,150,842	26,539,995	27,155,436

* Consumption data is missing for Bothell in 2004 and Northshore in 2005. Redmond did not provide data for 2004, 2005, 2006, and 2007. Bellevue and Tukwila did not provide data for 2006. Historical data is not available for Renton prior to 2007 nor available for Issaquah and Sammamish Plateau prior to 2008. Bellevue, Kirkland and WD 119 did not provide data for 2011, and WD 119 did not provide data for 2014, 2016, and 2017.

Figure 2.3

PERCENT GROWTH (OR DECLINE) IN RETAIL DEMAND BY UTILITY FROM 1995 TO 2017

Utility	Percent Change	
	1995-2017	Average Annual
Duvall	52.8%	1.9%
Redmond	37.6%	1.5%
W.D. 90	27.1%	1.1%
W.D. 119***	26.3%	1.2%
Cedar River	25.6%	1.0%
Kirkland*	23.8%	1.0%
Bothell	21.8%	0.9%
W.D. 45	2.4%	0.1%
Tukwila**	2.3%	0.1%
Soos Creek	1.6%	0.1%
WHOLESALE AVERAGE	-0.1%	0.0%
Bellevue*	-1.3%	-0.1%
Woodinville	-4.7%	-0.2%
Bellevue-Coal Creek*	-6.1%	-0.3%
Highline	-8.0%	-0.4%
Northshore	-9.6%	-0.5%
Olympic View	-10.3%	-0.5%
Mercer Island	-10.5%	-0.5%
W.D. 125	-17.7%	-0.9%
Skyway	-20.1%	-1.0%
W.D. 49	-22.1%	-1.1%
SEATTLE	-22.9%	-1.2%
W.D. 20	-24.0%	-1.2%
North City	-24.3%	-1.3%
Coal Creek*	-42.0%	-2.4%

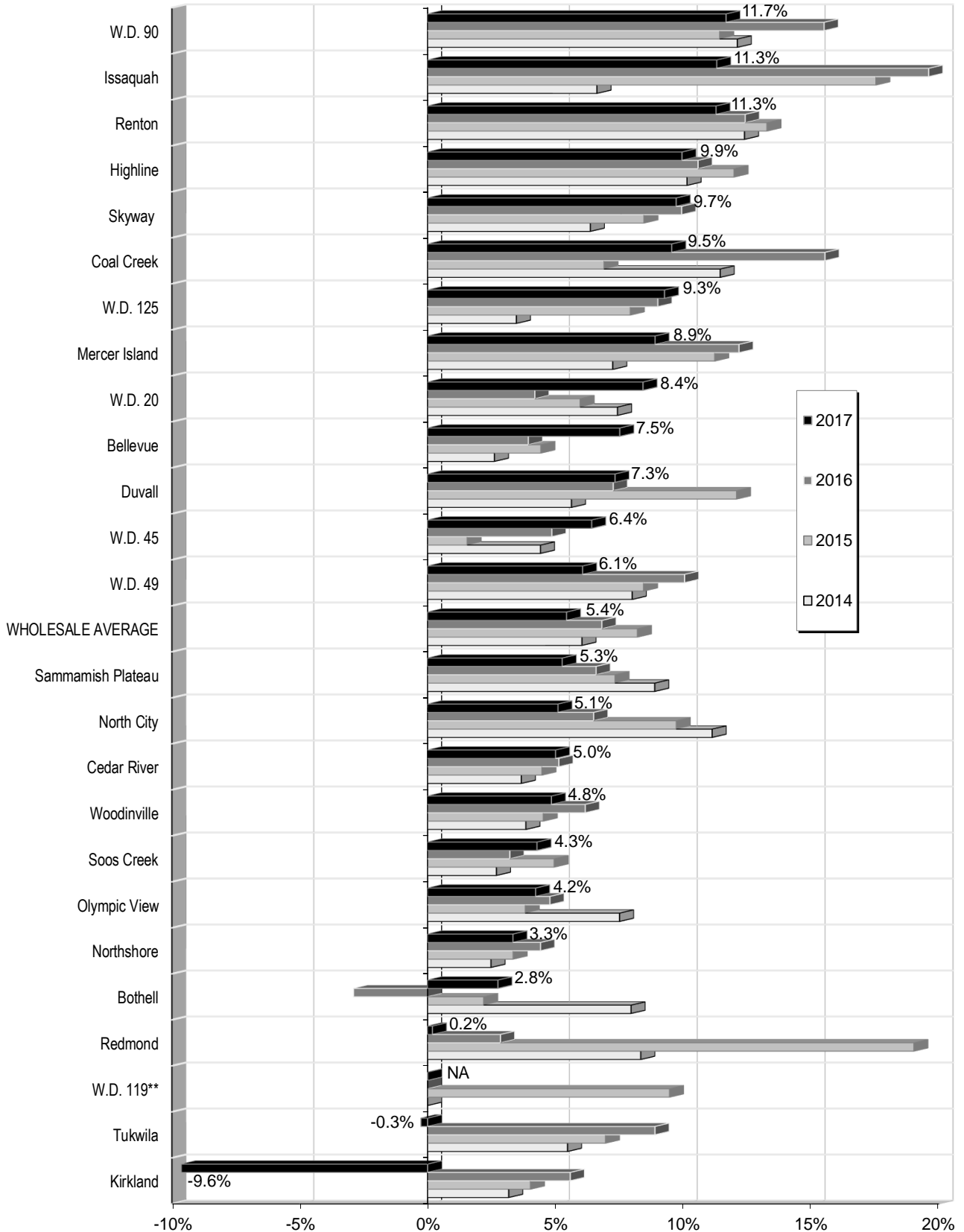


* Growth rates for Bellevue and Coal Creek reflect the impact of the annexation of a large portion of Coal Creek by Bellevue in 2003. Much of the 42% decline in Coal Creek's consumption is due to their transferring more than half their customers to Bellevue. The change in demand for the combined Bellevue/Coal Creek service area is also shown.

** Growth rate for Tukwila is measured from 1996, the year after a large area, including Boeing, was transferred from Seattle's retail service area to Tukwila.

*** WD 119 did not provide consumption data for 2016 or 2017 so annual growth rate is for the period 1995-2015.

Figure 2.4
2017 Wholesale Customer Non-Revenue Water as a Percentage of Total Water Use
 (2014, 2015 & 2016 Non-Revenue Shown in Gray)



* Members of Cascade Water Alliance

** Water District 119 did not provide consumption data for 2014, 2016 and 2017

Table 2.3
Wholesale Customer Distribution System Non-Revenue Water: 2003-2017

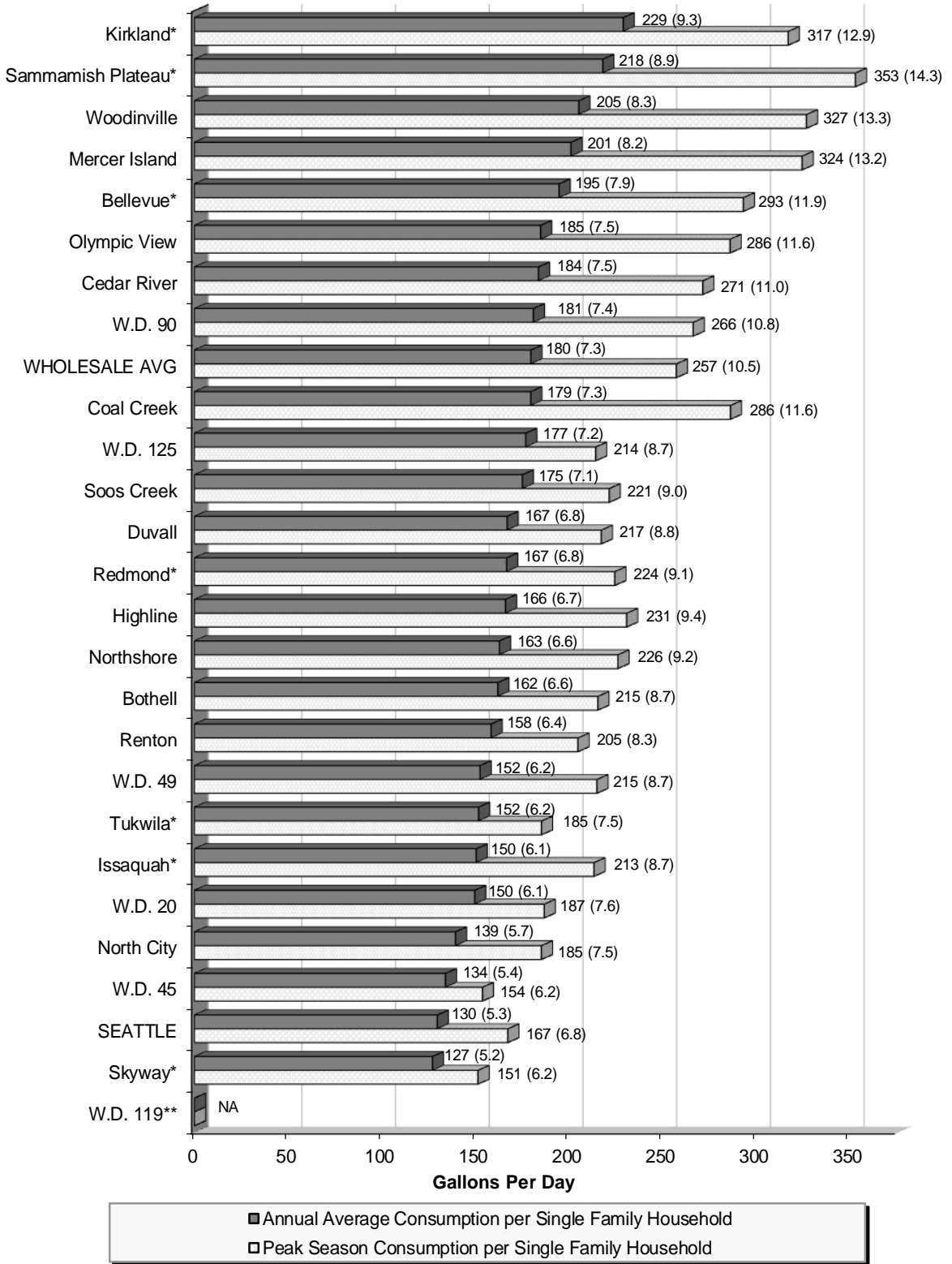
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	1994-2017 Average
Bellevue*	5.0%	8.6%	4.3%	NA	9.2%	12.5%	10.3%	10.9%	NA	3.5%	17.4%	2.6%	4.4%	3.9%	7.5%	7.5%
Bothell	6.6%	NA	18.7%	18.8%	4.6%	5.5%	4.7%	0.1%	6.6%	5.8%	5.0%	8.0%	2.2%	-2.9%	2.8%	6.4%
Cedar River	4.1%	7.3%	14.1%	10.0%	4.6%	1.9%	3.0%	3.9%	2.1%	-11.0%	3.9%	3.7%	4.5%	5.1%	5.0%	5.1%
Coal Creek	1.4%	10.6%	7.0%	5.9%	6.6%	8.4%	7.2%	9.6%	10.1%	8.9%	9.3%	11.4%	6.9%	15.5%	9.5%	6.3%
Duvall	10.1%	10.5%	13.1%	7.7%	4.5%	2.5%	5.2%	10.2%	7.3%	7.0%	9.3%	5.6%	12.1%	7.3%	7.3%	6.6%
Highline	5.7%	10.7%	7.8%	3.2%	7.2%	10.1%	8.2%	8.8%	8.1%	8.8%	6.4%	10.1%	12.0%	10.6%	9.9%	8.5%
Issaquah*	NA	NA	NA	NA	NA	13.0%	10.9%	11.8%	12.7%	9.9%	15.1%	6.6%	17.5%	19.6%	11.3%	12.8%
Kirkland*	5.0%	9.1%	0.7%	0.9%	4.5%	10.3%	7.0%	5.9%	NA	8.6%	10.3%	3.2%	4.0%	5.6%	-9.6%	4.1%
Lk Forest Pk	15.4%	21.0%	6.0%	14.3%	19.4%	39.8%	24.3%	13.7%	7.5%	16.3%	19.5%	25.3%	24.3%	0.0%	0.0%	12.6%
Mercer Island	1.4%	5.3%	8.2%	7.4%	10.1%	10.4%	3.1%	-1.2%	3.5%	9.6%	10.3%	7.2%	11.2%	12.2%	8.9%	6.5%
North City	5.6%	5.4%	5.9%	7.4%	6.6%	-0.7%	1.9%	3.3%	-13.2%	-9.2%	11.0%	11.1%	9.7%	6.5%	5.1%	4.7%
Northshore	4.8%	5.0%	NA	2.5%	1.9%	0.8%	1.2%	0.9%	6.7%	2.4%	1.2%	2.5%	3.3%	4.4%	3.3%	2.7%
Olympic View	-6.2%	2.6%	7.8%	8.5%	7.0%	5.8%	4.4%	6.1%	8.3%	8.5%	6.4%	7.5%	3.8%	4.8%	4.2%	5.6%
Redmond*	3.4%	NA	NA	NA	NA	7.2%	19.1%	26.1%	-2.5%	5.0%	5.2%	8.3%	19.0%	2.9%	0.2%	4.9%
Renton	12.1%	13.1%	14.3%	17.0%	20.2%	18.6%	16.9%	14.7%	13.0%	6.2%	9.4%	12.4%	13.3%	12.4%	11.3%	13.6%
Samm Plateau*	NA	NA	NA	NA	NA	9.5%	3.2%	7.8%	-1.9%	6.9%	9.5%	8.9%	7.3%	6.6%	5.3%	6.3%
Skyway*	4.3%	13.9%	20.0%	7.6%	5.1%	0.7%	4.4%	2.0%	8.1%	3.8%	6.7%	6.4%	8.5%	9.9%	9.7%	7.3%
Soos Creek	4.6%	13.4%	12.0%	9.1%	7.3%	7.5%	10.2%	9.6%	13.5%	4.0%	3.2%	2.7%	5.0%	3.2%	4.3%	7.2%
Tukwila*	14.8%	11.9%	2.4%	NA	13.3%	11.1%	9.9%	8.4%	11.3%	7.8%	7.1%	5.5%	7.0%	8.9%	-0.3%	11.9%
Woodinville	5.9%	7.4%	0.3%	-0.6%	5.6%	8.5%	9.0%	5.7%	3.6%	1.0%	9.2%	3.8%	4.5%	6.2%	4.8%	3.5%
W.D. 20	7.6%	3.1%	5.5%	7.6%	5.4%	7.1%	10.2%	7.1%	9.6%	6.4%	10.0%	7.4%	6.0%	4.2%	8.4%	6.8%
W.D. 45	0.9%	4.6%	7.3%	6.1%	6.1%	5.0%	5.3%	2.4%	6.3%	1.7%	6.4%	4.4%	1.5%	4.9%	6.4%	2.9%
W.D. 49	-5.4%	4.6%	-4.9%	-3.4%	5.4%	1.6%	0.4%	1.4%	14.1%	10.2%	4.5%	8.0%	8.4%	10.1%	6.1%	3.7%
W.D. 90	9.2%	11.3%	11.4%	7.7%	7.0%	11.0%	7.9%	8.6%	6.8%	12.7%	7.2%	12.1%	11.4%	15.5%	11.7%	13.2%
W.D. 119**	11.4%	15.5%	17.0%	4.4%	10.0%	7.4%	12.4%	11.5%	NA	7.4%	10.0%	NA	9.5%	NA	NA	8.3%
W.D. 125	15.4%	13.5%	14.4%	12.7%	12.7%	13.8%	8.5%	8.8%	7.6%	7.9%	8.6%	3.5%	7.9%	9.0%	9.3%	10.9%
Wholesale Avg	6.1%	9.4%	7.3%	7.0%	8.6%	9.7%	9.0%	9.9%	7.9%	5.3%	9.6%	6.3%	8.2%	6.8%	5.4%	7.3%

* Members of Cascade Water Alliance. No history available for Issaquah, and Sammamish Plateau prior to 2008.

** Water District 119 did not provide consumption data for 2014, 2016 and 2017 .

Figure 2.5

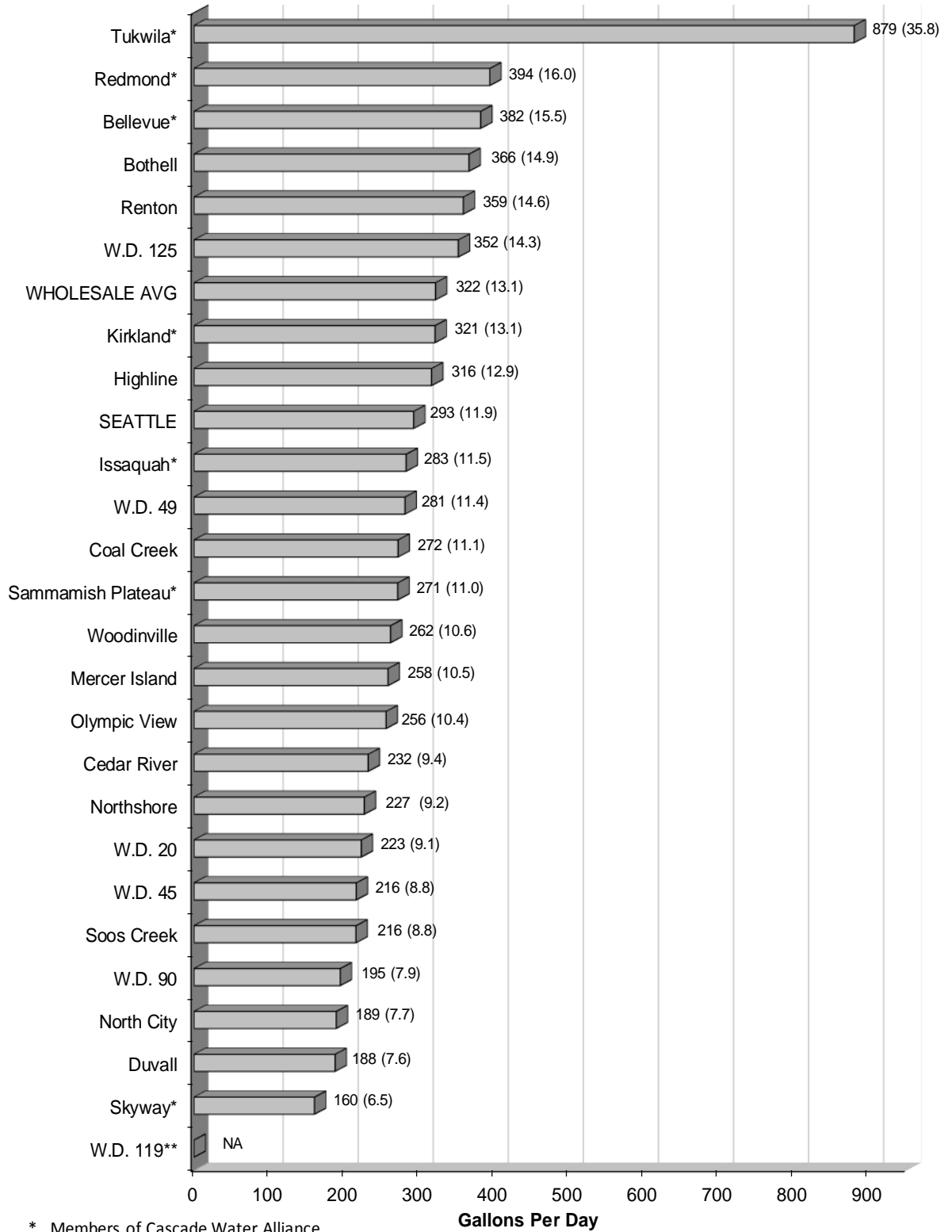
2017 Single Family Consumption per Household in Gallons per Day (CCF per Month)



* Members of Cascade Water Alliance

** W.D. 119 did not provide data for 2017.

Figure 2.6
2017 Total Consumption per Account
in Gallons per Day (CCF per Month)



* Members of Cascade Water Alliance
 **W.D. 119 did not provide data for 2017

Table 2.4

Single Family Residential Consumption per Household by Wholesale Customer: 1994-2017 (in CCF per Household per Month)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Bellevue*	10.4	10.0	9.8	9.4	10.0	9.6	9.7	8.9	9.1	9.7	10.4	8.5	NA	8.5	7.5	8.6	7.6	NA	7.7	7.6	7.8	8.1	7.8	7.9
Bothell	8.5	7.9	8.1	7.9	8.4	7.6	8.0	7.5	7.6	8.0	NA	5.7	5.7	9.1	7.2	7.3	7.2	6.1	6.3	6.4	7.2	6.4	6.1	6.6
Bryn Mawr	NA	NA	NA	NA	NA	7.5																		
Cedar River	9.9	9.7	9.7	9.1	9.6	8.9	9.5	8.0	8.6	9.1	8.6	7.8	8.5	7.9	7.4	8.3	7.1	6.8	7.2	7.1	7.1	7.6	7.1	7.5
Coal Creek	10.1	9.5	9.4	9.2	9.9	9.1	9.1	8.0	8.6	9.3	9.4	8.2	8.9	7.9	7.7	8.5	7.1	7.0	7.2	7.3	7.3	7.7	7.3	7.3
Duvall	NA	8.6	8.3	8.9	9.7	8.1	8.8	7.1	7.2	8.4	7.6	6.8	7.4	6.4	6.9	7.6	6.6	6.7	6.1	6.1	6.5	6.6	6.6	6.8
Highline	9.2	9.0	8.6	9.0	8.8	8.3	8.5	7.6	8.1	8.2	7.9	7.5	7.6	7.3	7.0	7.5	6.6	6.5	6.5	6.4	6.5	6.7	6.6	6.7
Issaquah*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.7	6.1	5.5	5.4	5.7	5.2	5.7	5.9	5.5	6.1
Kirkland*	8.8	8.6	8.5	8.5	8.6	8.2	9.3	7.5	8.0	8.9	7.8	10.4	7.8	7.8	7.3	7.8	6.8	NA	6.9	7.0	7.5	7.3	7.1	9.3
Mercer Island	NA	10.7	9.9	9.8	11.0	10.0	10.5	9.2	10.0	10.6	10.5	9.9	9.8	8.9	8.5	9.0	7.8	8.0	8.0	7.9	8.4	8.5	8.0	8.2
North City	8.3	7.9	7.8	7.5	7.9	NA	7.7	6.7	7.0	7.4	7.0	6.5	6.5	6.3	6.8	6.7	5.8	5.7	5.7	5.8	5.7	5.9	5.6	5.7
Northshore	9.6	9.2	9.0	8.6	9.8	8.7	8.5	8.1	8.4	8.9	8.4	NA	8.4	7.6	6.9	7.4	6.8	6.5	6.8	6.7	6.2	6.8	6.4	6.6
Olympic View	9.9	9.8	9.5	8.9	9.5	9.0	9.3	8.1	9.0	9.7	9.2	8.3	9.0	8.4	8.0	8.7	7.5	7.5	7.3	7.6	7.7	7.7	7.4	7.5
Redmond*	9.4	9.0	9.1	8.7	9.1	8.6	8.3	7.7	7.7	8.2	NA	NA	NA	NA	6.5	6.6	6.4	6.1	6.3	6.2	6.3	5.2	6.3	6.8
Renton	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.8	7.0	6.4	6.6	6.4	6.5	6.3	6.6	6.2	6.4
Sammamish Plateau*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.7	9.7	8.2	8.1	8.3	8.1	8.4	9.2	8.5	8.9
Skyway*	7.5	7.2	7.3	7.0	7.2	6.8	7.8	6.3	7.0	7.1	6.7	6.0	6.3	6.0	5.9	5.9	5.4	5.3	5.2	5.1	5.2	5.3	5.0	5.2
Soos Creek	8.7	8.4	8.4	7.7	8.2	7.8	7.8	7.0	7.5	8.5	8.1	6.8	6.9	7.2	7.0	7.2	6.5	6.6	7.1	7.1	7.0	6.7	7.0	7.1
Tukwila*	7.5	6.4	7.7	7.4	7.4	7.2	7.0	6.7	6.9	7.2	6.2	5.8	NA	6.6	6.2	6.7	6.1	5.8	5.9	6.0	6.1	6.1	5.8	6.2
Woodinville	12.0	11.1	11.3	10.5	11.7	10.7	11.1	10.8	10.4	11.6	10.4	9.1	10.2	8.9	8.6	9.5	7.9	7.9	8.1	8.2	8.9	8.7	7.8	8.3
W.D. 20	8.3	8.2	8.0	7.7	8.5	8.1	7.9	7.0	7.1	7.7	7.4	6.9	7.2	6.8	6.7	6.8	6.3	6.0	6.1	6.0	6.2	6.1	6.1	6.1
W.D. 45	NA	8.9	NA	NA	NA	6.8	7.5	6.8	7.6	6.9	6.4	6.2	6.4	6.3	6.0	6.2	5.9	5.7	5.7	5.5	5.5	5.6	5.4	5.4
W.D. 49	9.1	9.6	8.7	8.5	8.4	8.2	7.9	7.2	7.7	8.1	7.7	7.2	8.0	7.1	6.8	7.3	6.6	6.5	6.5	6.2	6.3	6.4	6.3	6.2
W.D. 85	NA	NA	NA	NA	NA	9.9	9.7	6.9	7.2															
W.D. 90	NA	NA	NA	NA	NA	8.4	9.5	8.5	8.8	8.7	8.5	7.5	8.2	7.7	7.4	8.0	6.8	6.9	7.0	7.1	7.1	7.5	7.0	7.4
W.D. 119	NA	NA	NA	NA	NA	8.1	8.2	7.7	8.1	9.1	8.2	7.5	9.0	7.6	7.6	8.1	7.1	NA	7.9	7.8	NA	8.8	NA	NA
W.D. 125	8.4	8.3	8.3	8.2	8.3	8.1	8.3	8.5	9.4	8.5	8.1	7.8	8.0	8.0	7.5	7.9	7.1	7.0	7.0	6.9	7.1	7.4	7.1	7.2
Wholesale Average	9.7	9.4	9.2	8.9	9.5	8.9	9.1	8.1	8.4	9.0	8.7	7.9	8.0	7.8	7.3	7.9	6.9	7.0	7.0	7.0	7.1	7.2	7.0	7.3
Seattle	7.9	7.6	7.4	7.1	7.1	7.1	7.3	6.5	6.7	6.6	6.4	6.0	6.2	5.9	5.7	5.9	5.4	5.2	5.3	5.3	5.3	5.3	5.1	5.3

* Members of Cascade Water Alliance. No history is available for Issaquah, and Sammamish Plateau prior to 2008.

No history is available for Renton prior to 2008. More recently, Bellevue and Kirkland did not provide data for 2011 and WD 119 did not provide data for 2011, 2014, 2016, and 2017.

Figure 2.7

Single Family Residential Consumption per Household

