11. Summer Water Use Peaking Factor

Target: Peaking factor is tracked year to year

About this indicator: Summer water use peaking factor is calculated from the maximum consumption divided by average usage. This indicator reports data from three types of water users Group A public water system (PWS) users, Group B PWS users and individuals.

Influencing factors: Weather conditions during the summer time - amount of precipitation for a given year and/or the average daily temperature. Limited water usage data available.

2010 Target: Summer water use peaking factor is tracked year to year.

2010 Finding: Water use peaks in the summer by a factor 1.8 based on an island-wide average.

2010 Status: Summer water use peaking factors range from 1.2 to 2.4 based on data from selected Group A public water systems. The average of the 2010 data is 1.8. No assessment is done annually.
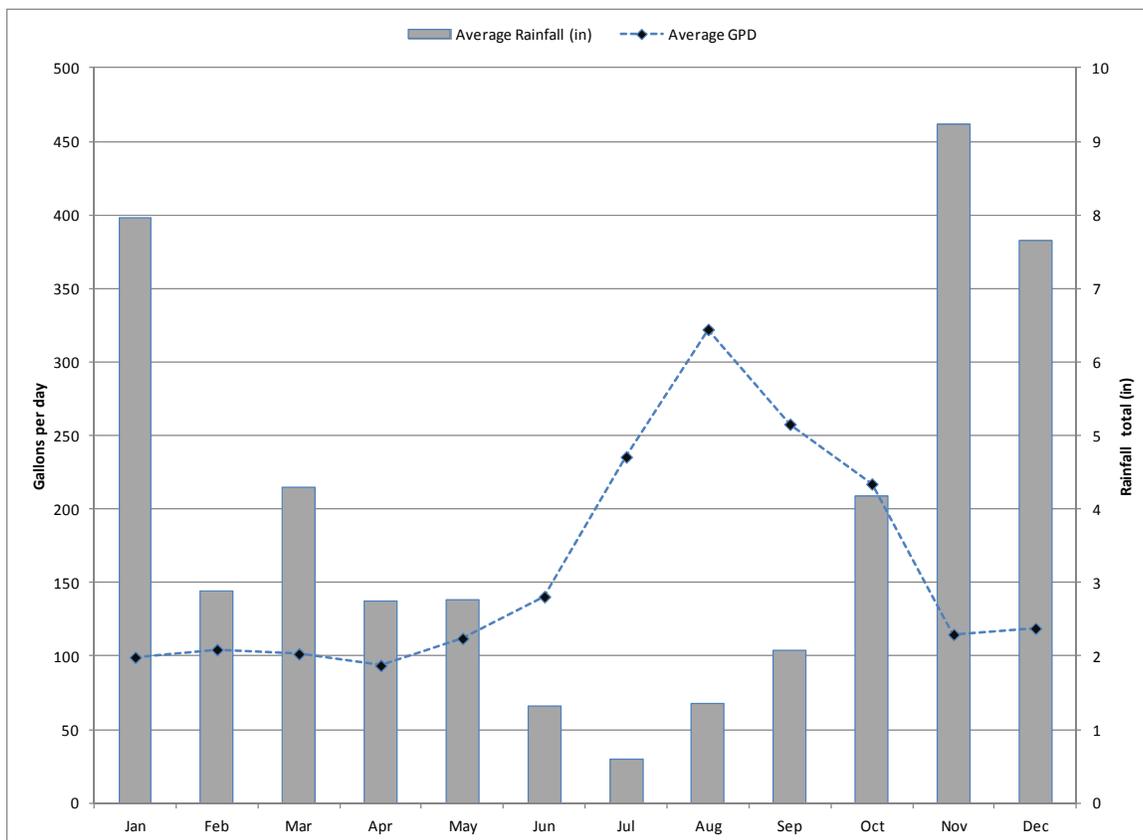

Figure 1. Average water use of individuals with monthly rainfall totals for the North Vashon rain gauge (43U). Rainfall data are average monthly totals from water years 2004-2010. Water usage is averaged gallons per day (GPD) by month from individuals who participate in self monitoring/metering volunteer program. This usage data is from 2007 to 2010. Maximum usage typically occurs in August with a peaking factor of 3.2 for all users. On average, two-thirds of the total annual usage is consumed during May thru October period while July thru September can be over 40% of the total annual usage.

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2001-2010 Target: No long term (10 or more years) increase in summer water use peaking factor.

2001-2010 Assessment: Summer water use peaking factors range from 1.2 to 4.4 based on 2001 – 2010 data from selected Group A public water systems.
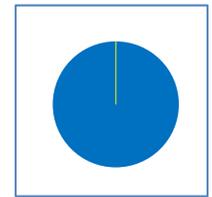
2001-2010 Status: Summer water use peaking factors range from 1.2 to 4.4 based on data from selected Group A public water systems, Table 1. A Group B PWS and individuals who report their usage have similar peaking factor. High peaking factor of ~8 can occur as noted by one individual user, Table 1. A range of calculated peaking factor from different users are presented in Figure 2.

Table 1. Peaking Factors (2001 to 2010) from selected water users. Peaking factor is calculated annually from the maximum monthly usage divided by an average monthly usage.

Water User\Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Grp A PWS - H	1.4	1.9	2.2	2.1	1.9	1.9	1.9	1.8	2.3	1.6
Grp A PWS -19	1.6	1.9	1.7	2.3	2.0	2.2	1.9	2.0	2.4	2.0
Grp A PWS -D	*	*	*	*	*	*	*	*	*	1.8
Grp A PWS -NC	*	*	3.7	2.8	2.8	4.4	2.8	2.6	3.3	2.4
Grp A PWS -BP	*	*	*	*	*	*	1.9	2.0	1.6	1.2
Grp B PWS - BC	*	*	*	*	*	*	2.3	1.6	1.7	1.6
Individual A	—						1.3	1.7	2.3	1.3
Individual B	—						8.8	8.6	7.4	ND

"*" = Data not reported
ND = No data collected for this year.
"—" = Data collect did not start until 2007.

Technical Notes Summer Water Use Peaking Factor

Data source: The data for this indicator comes from Group A public water systems (PWS), Group B PWS, and individual water users. Group B PWS are not required to report their usage and individual wells do not typically have meters to assess their usage. Both of these user groups have a small subset that do report their usage. However, this subset of users and their usage data are not totally representative of the entire user group.

Collection frequency: Group A PWS are required to keep track of their water usage. Recent changes require more Group A PWS to report their usage annually. The other water users are not required to report their usage. Water use data has been requested from a variety of users.

Methods for analysis: For Group A systems with a published water system plan, the peaking factor is for that system is reported. For users with monthly usage data, a peaking factor is calculated annually from the maximum monthly usage divided by an average usage month. When multi-years of data are assessed, the annual peaking factor is averaged. The range of peaking factors for Group A PWS is 1.2 to 4.4 based on data from 7 systems.

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Eight individual well owners have installed a meter and reported usage data. One Group B PWS reports their usage on a regular basis.

 Data Reliability and Quality: The data quality of this indicator can be good when data is provided by the island purveyors. Estimates are based on a small subset of data users and compared to other published data. The reliability is fair based in the recent participation and should improve due to changes in reporting requirements for most Group A PWS.

Data Reference: VMI Water Purveyors; various King County programs including Groundwater, UTRC; and VMI Volunteer Monitoring Program who self report usage.
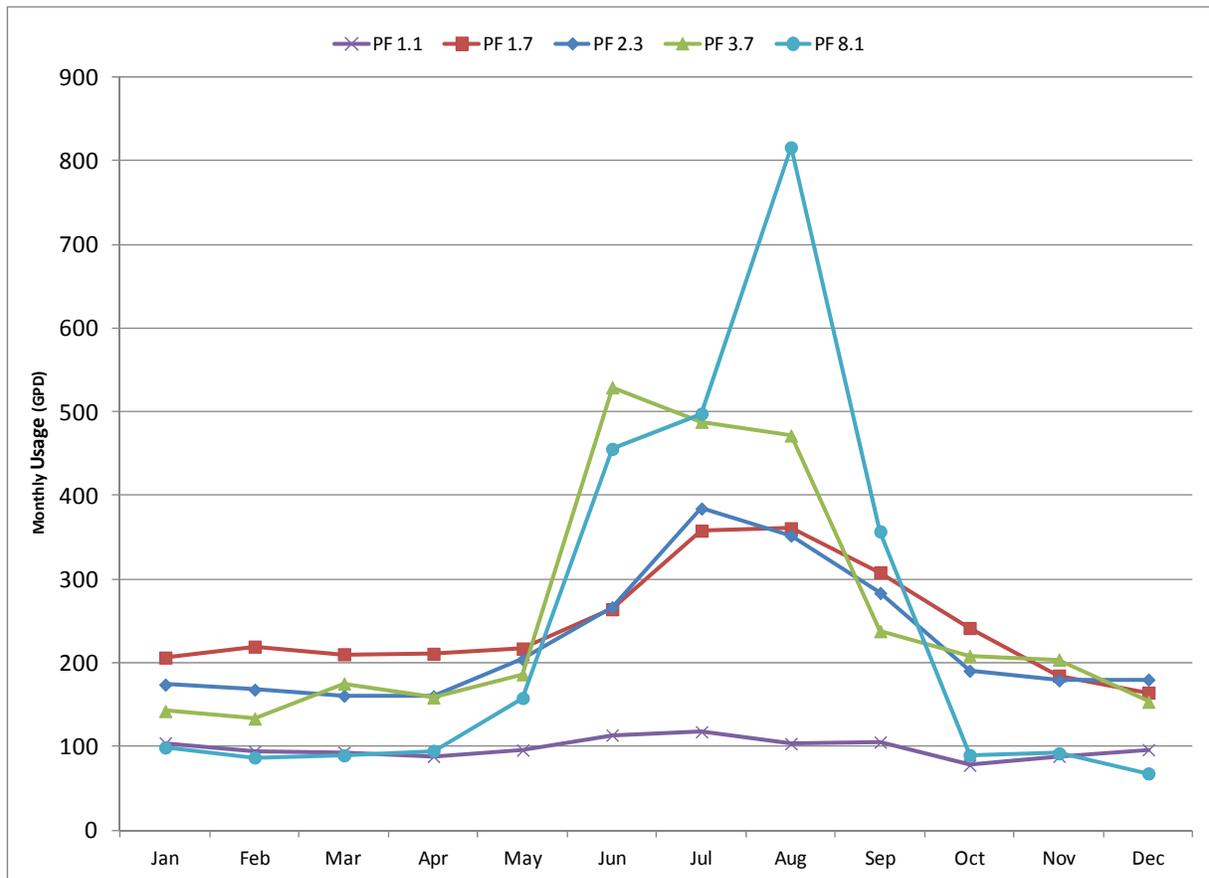
Figure 2. Example of peaking factors by user type – Group A Public Water System (PWS); Group B PWS and individuals. The peaking factor calculation is the maximum monthly usage divided by the average monthly usage. Example data are from 2 Group A PWS (pf 1.7; pf 3.7), 1 Group B PWS (pf 2.3) and 2 individual well owners (pf 1.1; pf 8.1). The user with a PF 1.7 (not pf 8.1) uses the most water annually based on the cumulative total of the daily usage.

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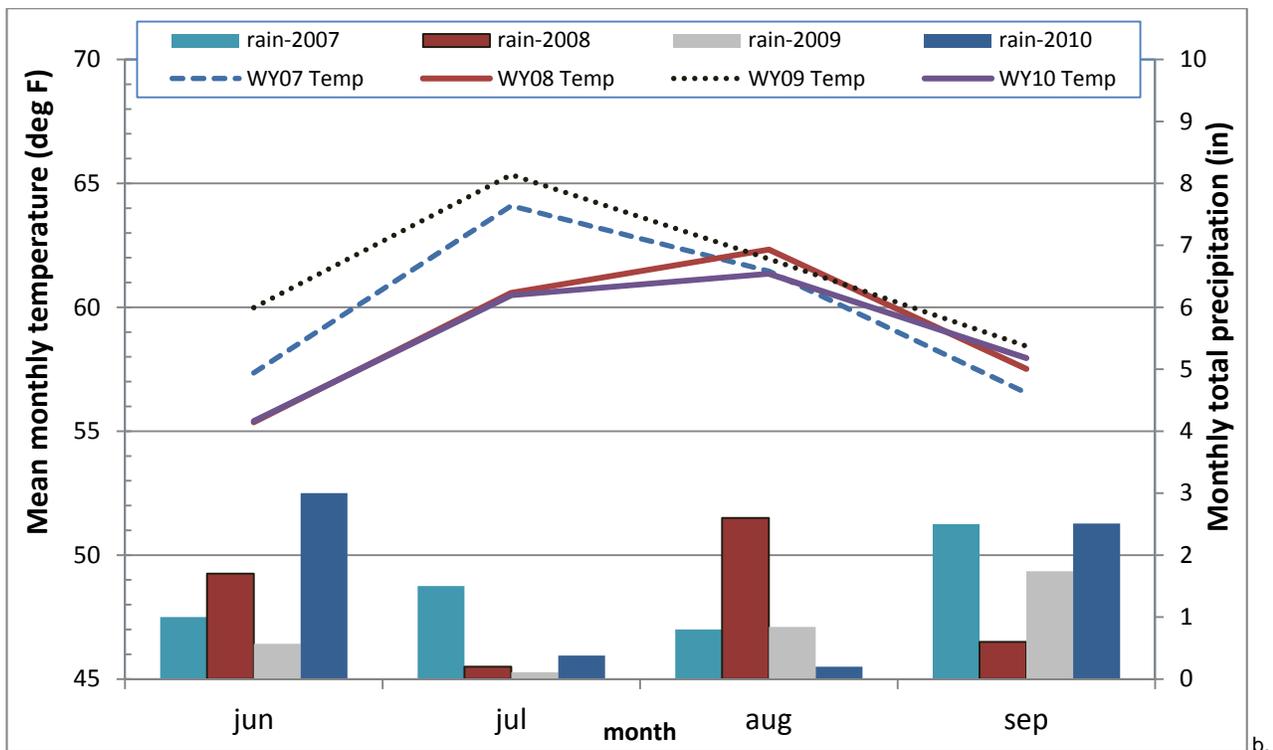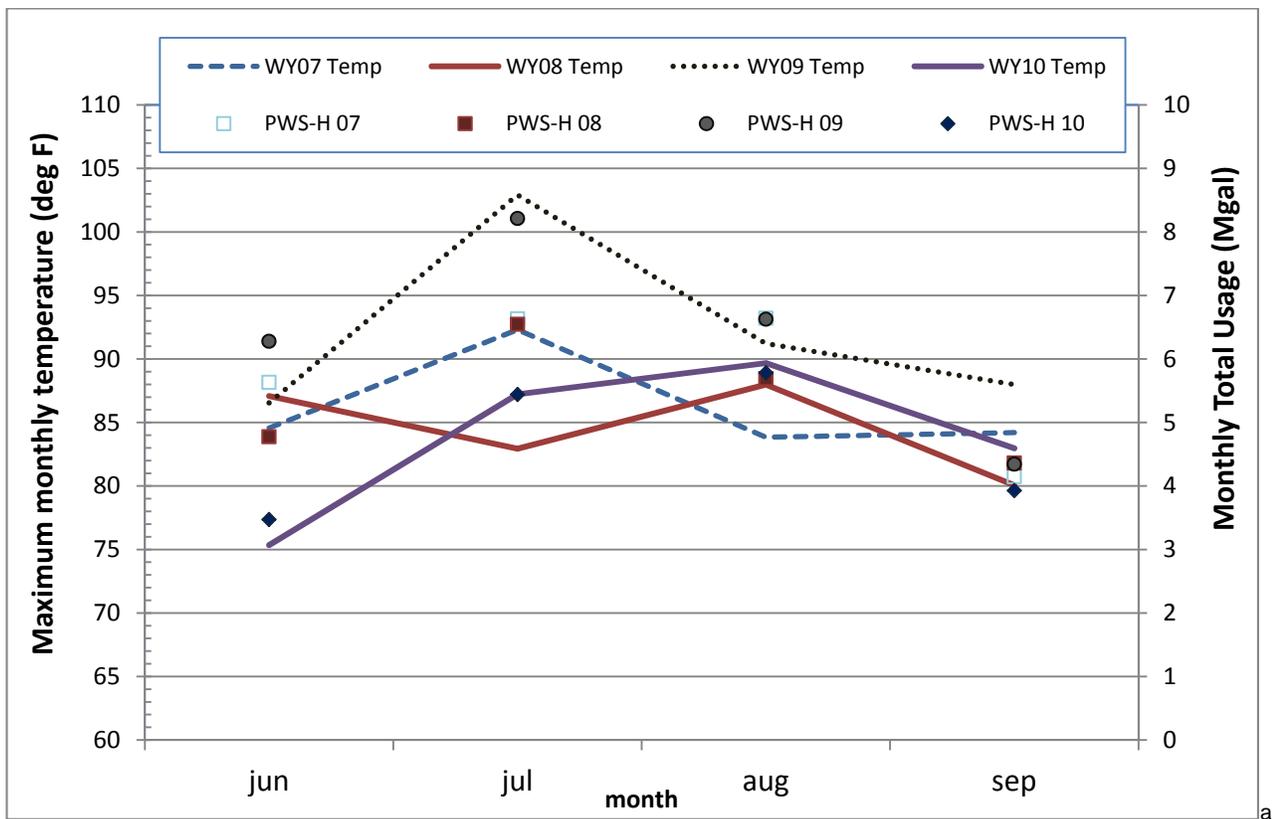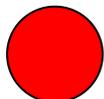
Figure 3 (a + b). Data from West Judd Creek – gauge site 28Y and one Group A public water system from 2007 to 2010. Figure 3a - Monthly maximum temperatures are shown for the summer period of June through September along with total usage from a public water system shown on the second axis. Figure 3b - Monthly median temperatures along with monthly total precipitation (second axis). Peaking occurs typically during July or August during periods of higher temperatures and lower precipitation. Units are degrees Fahrenheit (deg F); inches (in); millions of gallons (Mgal).

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Legend

2010 Finding

Poor Conditions: Reported data are above Maximum Contaminant Level (MCL) and/or fails to meet the state standard or criteria for a given indicator; needs improvement.
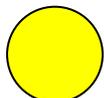
Fair Conditions: On average, data fell between the standard or criteria for "poor" and "good" and may be variable.
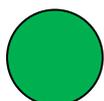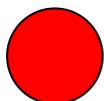
Good Conditions: Reported data are below MCL and/or meet the state standard or criteria for a given indicator.
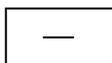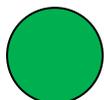
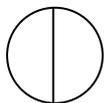—   **No Annual Assessment**

2001-2010 Status

Downward Trajectory: 2001-2010 data shows decreasing or worsening conditions

No Change: 2001-2010 data shows no change with time.

Upward Trajectory: 2001-2010 data indicate increasing or improving conditions

Insufficient Data: reported data has too few data points and/or too short a period

King County

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