

# Appendix M

## Municipal Water Demand Forecast

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## **M.1 Introduction**

In this Appendix, results are presented for the water demand forecasts by sub-region (includes county and region forecasts). The forecasts provided include the baseline demand forecast (M.2), demographic growth scenario forecasts (M.3), and weather variability and global climate change forecasts (M.4).

## **M.2 Baseline Demand Forecast**

### **M.2.1 Forecast Assumptions**

The following forecast assumptions were used to prepare the baseline water demand forecast:

- Expected demographic projections prepared by the PSRC reflect the most likely future conditions for growth.
- GIS allocation of demographics accurately reflects demographic conditions within the boundaries of each purveyor.
- Forecast assumes long-term average values for the weather variables total monthly precipitation and average maximum daily temperature. Water demand is only affected by weather patterns in the months of May, June, July, August, and September. Weather elasticities are the same for each of those months and are as follows: total monthly precipitation elasticity is -0.03, average maximum daily temperature elasticity is 5.85. There is no regional or sector variation in weather elasticities.
- Income, in real terms, will increase at 0.5% annually; and price of water, in real terms, will increase at 1.0% annually. Income and price of water elasticities for the single-family sector will be 0.300 and -0.250 (respectively), income and price of water elasticities for the multifamily sector will be 0.150 and -0.075 (respectively), and price of water elasticity for the nonresidential sector will be -0.225. Under future conditions, there will be no regional variation in income or price of water elasticities.
- Large users' water use will not experience sector growth but will be impacted by conservation and weather effects. Large users' employment will remain constant in future years.
- Conservation savings (i.e., the reduction in total water demand from conservation actions) will occur as estimated by the percent reduction in total demand.
- Conservation savings will occur evenly throughout the region, and include both passive and utility goal conservation efforts.
- Non-Revenue Water is estimated as a percentage of total demand, and the percentage remains the same over time for each sub-basin unless the weighting of the NRW percentage changes due to shifts in relative population of providers within the sub-region.

## M.2.2 Results of Baseline Forecast

Table M-1 shows the results of the baseline demand forecast. This forecast includes passive and utility goals conservation savings.

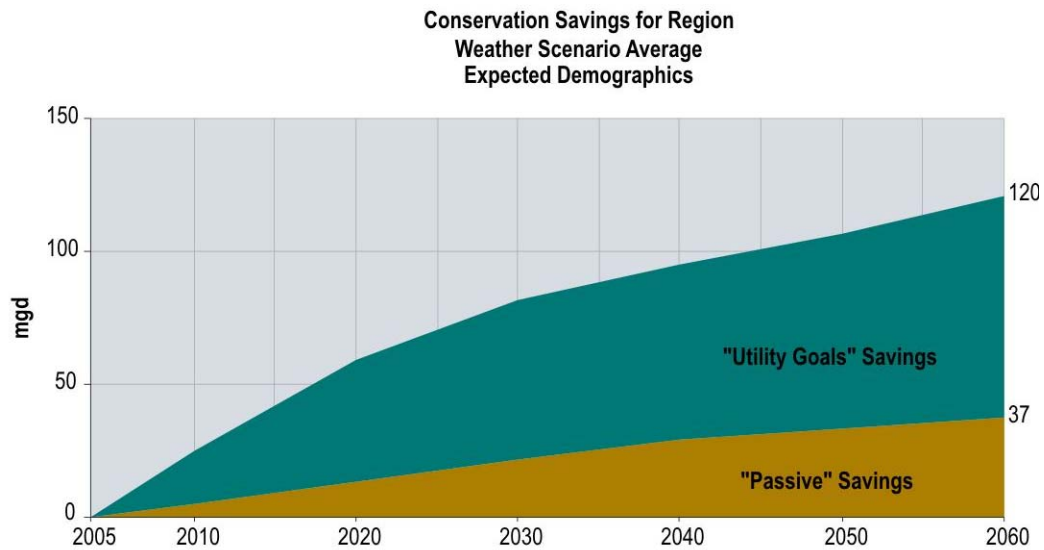
**Table M-1 Baseline Water Demand Forecast by Sub-Region (MGD) \***

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	46.1	45.4	48.3	52.3	57.8	64.7	73.0
East King County CWSP PA	69.8	69.4	73.8	79.2	86.3	95.8	107.0
Vashon CWSP PA	0.5	0.5	0.5	0.5	0.6	0.6	0.7
Seattle Public Utilities - Retail	63.8	61.1	62.1	64.1	67.7	72.6	78.1
Seattle Public Utilities - Wholesale	78.3	76.8	80.4	85.8	93.0	102.7	114.3
King County Wastewater	199.2	196.0	207.0	220.3	239.6	265.0	294.8
Cascade Water Alliance	40.4	40.5	43.8	47.2	51.4	57.0	63.6
Tacoma Public Utilities - Retail	55.5	53.6	54.6	57.0	62.0	68.1	75.1
Tacoma Public Utilities - Wholesale	19.4	20.1	23.1	25.9	29.8	34.7	40.6
Pierce COOP	35.2	35.7	38.9	42.6	48.5	55.9	64.8
Kitsap Peninsula	3.5	3.6	4.1	4.6	5.2	6.1	7.1
Everett	82.3	82.3	88.3	94.4	103.9	115.9	130.2
Rest of Snohomish	5.5	5.7	6.6	7.5	8.5	9.9	11.5
King Co. (Utility Supplied)	187.4	183.4	191.8	203.6	220.4	242.6	268.6
Pierce Co. (Utility Supplied)	102.9	101.6	107.2	114.6	127.3	143.3	162.3
Snohomish Co. (Utility Supplied)	87.9	88.0	95.0	101.9	112.5	125.9	141.8
King Co. (Self-Supplied)	2.6	2.6	2.6	2.8	3.0	3.7	5.0
Pierce Co. (Self-Supplied)	12.0	12.2	13.3	14.7	16.6	19.3	23.0
Snohomish Co. (Self-Supplied)	4.1	4.1	4.6	5.2	6.0	7.0	8.3
King County Total	190.0	186.0	194.5	206.4	223.5	246.3	273.5
Pierce County Total	114.9	113.8	120.6	129.3	144.0	162.7	185.3
Snohomish County Total	91.9	92.0	99.5	107.0	118.4	132.8	150.1
<b>Regional Total</b>	<b>396.8</b>	<b>391.8</b>	<b>414.6</b>	<b>442.7</b>	<b>485.8</b>	<b>541.8</b>	<b>608.8</b>

\*Note: The sub-regions are non-additive

Conservation savings are estimated to exceed 120 MGD by 2060, as shown in Figure M-1. Two-thirds of these savings (or 83 MGD) are estimated to occur due to utility goals, while 37 MGD are estimated to be from passive conservation.

**Figure M-1 Baseline Demand Forecast Regional Conservation Savings**



### **M.3 Demographic Growth Scenarios**

Since projected demographics drive the water demand forecast, sensitivity was conducted to determine the range of potential water demands under different growth scenarios.

#### **M.3.1 Forecast Assumptions**

All assumptions listed under the baseline demand forecast in Section M.2.1 are applicable to the demographic growth scenario forecast, with the following exceptions:

For the low growth scenario, future demographic conditions will be as described in Appendix I.

For the high growth scenario, future demographic conditions will be as described in Appendix I.

#### **M.3.2 Results of Demographic Growth Scenarios**

Results of the low demographic growth forecast are shown in Table M-2; while results of the high demographic growth forecast are shown in Table M-3. Figure M-2 shows the range in the demand forecast resulting from these different growth scenarios.

**Table M-2 Water Demand Forecast with Low Demographic Growth by Sub-Region (MGD)**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	46.1	44.1	45.1	47.3	50.6	54.4	59.2
East King County CWSP PA	69.8	67.3	69.0	71.6	75.5	80.4	86.6
Vashon CWSP PA	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Seattle Public Utilities - Retail	63.8	59.4	58.4	58.4	59.8	61.8	64.2
Seattle Public Utilities - Wholesale	78.3	74.5	75.2	77.7	81.4	86.4	92.7
King County Wastewater	199.2	190.2	193.8	199.8	210.2	223.4	239.7
Cascade Water Alliance	40.4	39.3	41.0	42.8	45.0	48.0	51.6
Tacoma Public Utilities - Retail	55.5	52.5	52.1	53.1	56.2	59.6	63.7
Tacoma Public Utilities - Wholesale	19.4	19.5	21.6	23.4	26.0	29.1	32.8
Pierce COOP	35.2	34.6	36.4	38.5	42.4	46.9	52.4
Kitsap Peninsula	3.5	3.5	3.9	4.1	4.6	5.1	5.7
Everett	82.3	80.7	84.4	88.0	94.3	101.6	110.5
Rest of Snohomish	5.5	5.5	6.2	6.7	7.4	8.3	9.3
King Co (Utility Supplied)	187.4	178.0	179.8	184.7	193.5	204.7	218.6
Pierce Co (Utility Supplied)	102.9	99.1	101.3	105.2	113.4	122.8	134.3
Snohomish Co (Utility Supplied)	87.9	86.3	90.6	94.8	101.8	109.9	119.9
King Co (Self-Supplied)	2.6	2.5	2.5	2.5	2.6	3.1	4.1
Pierce Co (Self-Supplied)	12.0	11.8	12.4	13.2	14.5	16.1	18.6
Snohomish Co (Self-Supplied)	4.1	4.0	4.3	4.7	5.2	5.8	6.7
King Co	190.0	180.5	182.2	187.2	196.1	207.8	222.6
Pierce Co	114.9	110.9	113.8	118.5	127.8	139.0	152.9
Snohomish Co	91.9	90.2	94.8	99.4	106.9	115.7	126.5
<b>Regional Total</b>	<b>396.8</b>	<b>381.6</b>	<b>390.7</b>	<b>405.1</b>	<b>430.8</b>	<b>462.5</b>	<b>502.0</b>

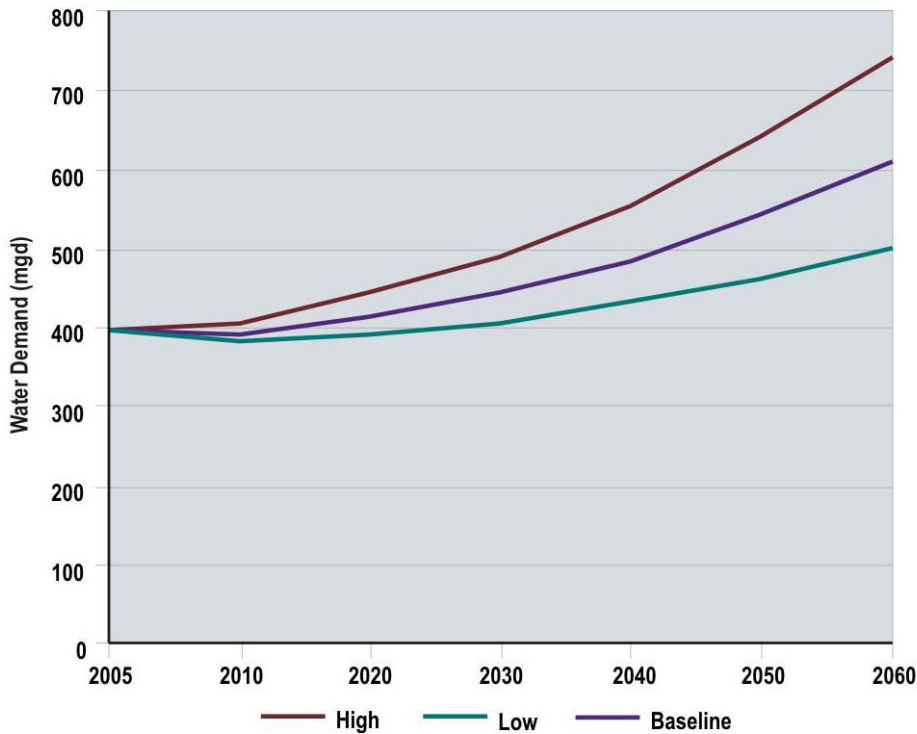
\*Note: The sub-regions are non-additive

**Table M-3 Water Demand Forecast with High Demographic Growth  
by Sub-Region (MGD)**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	46.1	47.1	52.0	58.6	67.0	77.6	90.2
East King County CWSP PA	69.8	72.0	79.5	88.9	100.2	115.1	132.5
Vashon CWSP PA	0.5	0.5	0.5	0.6	0.7	0.8	0.9
Seattle Public Utilities - Retail	63.8	63.2	66.5	71.3	77.7	86.1	95.5
Seattle Public Utilities - Wholesale	78.3	79.6	86.6	96.3	107.8	123.2	141.2
King County Wastewater	199.2	203.2	222.7	246.7	277.2	317.0	363.6
Cascade Water Alliance	40.4	42.0	47.2	52.9	59.5	68.3	78.6
Tacoma Public Utilities - Retail	55.5	54.9	57.6	62.1	69.4	78.6	89.2
Tacoma Public Utilities - Wholesale	19.4	20.9	24.9	29.1	34.6	41.7	50.4
Pierce COOP	35.2	37.0	42.0	47.9	56.4	67.2	80.4
Kitsap Peninsula	3.5	3.8	4.5	5.2	6.1	7.3	8.7
Everett	82.3	84.3	93.0	102.7	116.3	133.8	154.9
Rest of Snohomish	5.5	5.9	7.1	8.4	9.9	11.9	14.2
King Co (Utility Supplied)	187.4	190.1	206.4	227.9	254.9	290.1	331.0
Pierce Co (Utility Supplied)	102.9	104.8	114.3	126.7	145.3	168.9	197.2
Snohomish Co (Utility Supplied)	87.9	90.2	100.2	111.1	126.3	145.8	169.2
King Co (Self-Supplied)	2.6	2.7	2.8	3.1	3.5	4.4	6.1
Pierce Co (Self-Supplied)	12.0	12.7	14.4	16.6	19.3	23.3	28.6
Snohomish Co (Self-Supplied)	4.1	4.3	5.0	5.9	7.0	8.5	10.4
King Co	190.0	192.7	209.2	231.0	258.4	294.6	337.1
Pierce Co	114.9	117.5	128.7	143.3	164.7	192.3	225.8
Snohomish Co	91.9	94.4	105.1	116.9	133.1	154.1	179.5
<b>Regional Total</b>	<b>396.8</b>	<b>404.6</b>	<b>443.0</b>	<b>491.2</b>	<b>556.2</b>	<b>640.9</b>	<b>742.4</b>

\*Note: The sub-regions are non-additive

**Figure M-2 Comparison of Demographic Growth Scenario Forecasts with Base Demand Forecast**



As seen in Figure M-2, water demands in 2060 could be as low as 500 MGD (18% lower than baseline) or as high as 750 MGD (22% greater than baseline), depending on projected demographic growth.

## M.4 Forecast under Weather and Climate Change Scenarios

Water demands are also greatly affected by weather and long-term climate change trends. As such, sensitivity in demands was estimated due to ranges in historical weather and climate change trends.

### M.4.1 Forecast Assumptions

All assumptions listed under the baseline demand forecast in M.2.1 are applicable to the weather and climate change scenario forecasts, with the following exception. The weather and climate change forecasts assume the given weather or climate change condition future values for the weather variables total monthly precipitation and average maximum daily temperature.

### M.4.2 Results of Historical Weather Scenarios

Water demand forecasts under historical weather scenarios are shown in Tables M-4 and M-5. Figure M-3 shows these demands in comparison with baseline projections.

**Table M-4 Water Demand Forecast under Cool and Wet Conditions**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	44.1	43.4	46.1	49.9	55.1	61.7	69.6
East King County CWSP PA	66.7	66.3	70.4	75.5	82.3	91.4	102.0
Vashon CWSP PA	0.5	0.5	0.5	0.5	0.5	0.6	0.7
Seattle Public Utilities - Retail	61.2	58.5	59.4	61.2	64.7	69.3	74.6
Seattle Public Utilities - Wholesale	75.1	73.5	76.9	82.0	88.8	98.1	109.1
King County Wastewater	190.8	187.7	198.0	210.6	229.0	253.1	281.6
Cascade Water Alliance	38.7	38.8	41.9	45.1	49.1	54.4	60.8
Tacoma Public Utilities - Retail	53.1	51.3	52.3	54.5	59.3	65.1	71.8
Tacoma Public Utilities - Wholesale	18.6	19.3	22.1	24.8	28.5	33.2	38.8
Pierce COOP	33.7	34.2	37.2	40.7	46.3	53.4	61.9
Kitsap Peninsula	3.4	3.5	4.0	4.4	5.0	5.8	6.7
Everett	79.2	79.1	84.9	90.7	99.8	111.4	125.1
Rest of Snohomish	5.3	5.5	6.4	7.2	8.2	9.5	11.0
King Co (Utility Supplied)	179.5	175.6	183.5	194.6	210.6	231.8	256.6
Pierce Co (Utility Supplied)	98.5	97.3	102.6	109.6	121.7	137.0	155.1
Snohomish Co (Utility Supplied)	84.5	84.7	91.3	97.9	108.1	120.9	136.2
King Co (Self-Supplied)	2.5	2.4	2.5	2.6	2.9	3.5	4.8
Pierce Co (Self-Supplied)	11.5	11.7	12.7	14.0	15.8	18.5	22.0
Snohomish Co (Self-Supplied)	4.0	3.9	4.4	5.0	5.7	6.7	7.9
King Co	182.0	178.1	186.0	197.3	213.5	235.3	261.3
Pierce Co	110.1	109.0	115.4	123.7	137.6	155.5	177.1
Snohomish Co	88.4	88.5	95.7	102.8	113.7	127.5	144.2
<b>Regional Total</b>	<b>380.5</b>	<b>375.6</b>	<b>397.1</b>	<b>423.8</b>	<b>464.8</b>	<b>518.3</b>	<b>582.5</b>

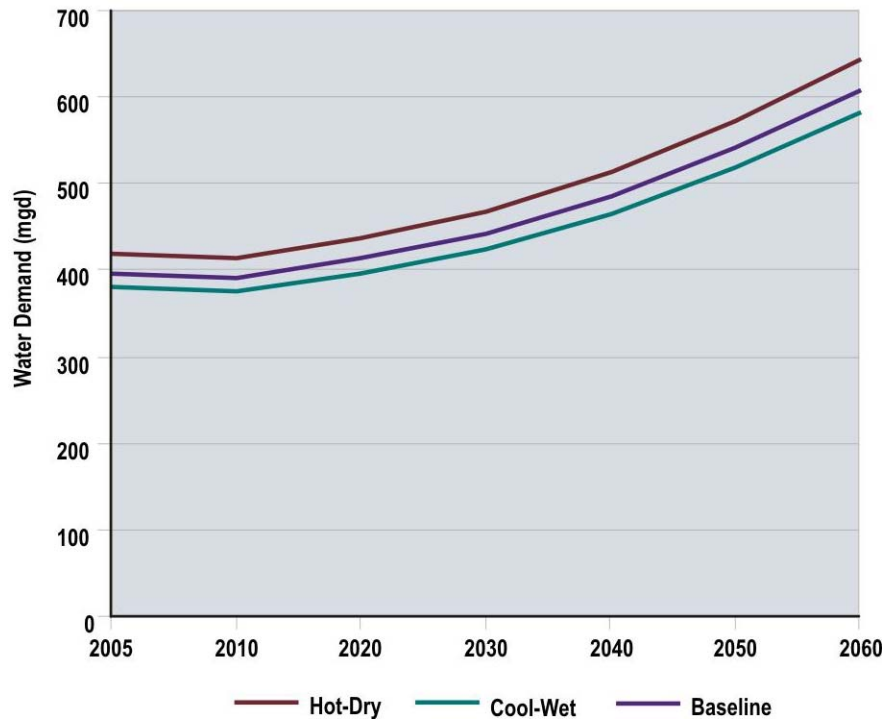
\*Note: The sub-regions are non-additive

**Table M-5 Water Demand Forecast under Hot and Dry Conditions**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	48.7	48.0	51.1	55.4	61.3	68.6	77.4
East King County CWSP PA	73.7	73.4	78.1	83.9	91.6	101.7	113.5
Vashon CWSP PA	0.5	0.5	0.5	0.6	0.6	0.7	0.7
Seattle Public Utilities - Retail	67.4	64.5	65.6	67.8	71.7	76.8	82.6
Seattle Public Utilities - Wholesale	82.7	81.1	85.0	90.8	98.5	108.8	121.0
King County Wastewater	210.2	207.0	218.8	233.1	253.8	280.6	312.0
Cascade Water Alliance	42.6	42.8	46.3	50.0	54.4	60.4	67.3
Tacoma Public Utilities - Retail	58.5	56.6	57.7	60.3	65.5	72.0	79.4
Tacoma Public Utilities - Wholesale	20.5	21.3	24.5	27.4	31.5	36.7	43.0
Pierce COOP	37.2	37.7	41.1	45.1	51.3	59.2	68.6
Kitsap Peninsula	3.7	3.9	4.4	4.9	5.5	6.4	7.5
Everett	86.3	86.4	92.8	99.2	109.3	121.9	136.9
Rest of Snohomish	5.8	6.0	7.0	7.9	9.0	10.4	12.1
King Co (Utility Supplied)	197.8	193.7	202.9	215.5	233.5	256.9	284.3
Pierce Co (Utility Supplied)	108.6	107.3	113.3	121.2	134.7	151.6	171.6
Snohomish Co (Utility Supplied)	92.2	92.4	99.8	107.1	118.3	132.4	149.1
King Co (Self-Supplied)	2.8	2.7	2.8	2.9	3.2	3.9	5.3
Pierce Co (Self-Supplied)	12.7	12.9	14.1	15.5	17.6	20.5	24.4
Snohomish Co (Self-Supplied)	4.4	4.4	4.9	5.5	6.3	7.4	8.8
King Co	200.5	196.4	205.6	218.4	236.7	260.9	289.5
Pierce Co	121.3	120.2	127.4	136.7	152.3	172.1	196.0
Snohomish Co	96.4	96.6	104.5	112.5	124.4	139.6	157.8
<b>Regional Total</b>	<b>418.3</b>	<b>413.2</b>	<b>437.6</b>	<b>467.6</b>	<b>513.4</b>	<b>572.6</b>	<b>643.3</b>

\*Note: The sub-regions are non-additive

**Figure M-3 Water Demand Forecast under Different Weather Conditions**



As seen in this figure, water demands in 2060 can be as low as 583 MGD (4% lower than baseline) or as high as 643 MGD (5% higher than baseline), depending on historical weather.

### **M.4.3 Results of Climate Change Scenarios**

Water demand forecasts under three different climate change scenarios are presented in Tables M-6 through M-8. These climate change scenarios are described in Appendix H. It should be noted that these climate change scenarios represent different climate even in the base year of 2005. Therefore, interpretation of the climate change impacts on water demands requires careful consideration.

**Table M-6 Water Demand Forecast under GISS\_B1 Climate Change Model Scenario**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	46.0	45.5	48.5	52.7	58.5	65.7	74.5
East King County CWSP PA	69.7	69.4	74.1	79.9	87.4	97.4	109.3
Vashon CWSP PA	0.5	0.5	0.5	0.6	0.6	0.7	0.7
Seattle Public Utilities - Retail	66.1	63.4	64.8	67.2	71.4	76.8	83.1
Seattle Public Utilities - Wholesale	81.1	79.7	83.9	90.0	98.1	108.8	121.7
King County Wastewater	206.1	203.4	216.0	231.1	252.6	280.5	313.9
Cascade Water Alliance	41.8	42.0	45.7	49.6	54.2	60.4	67.7
Tacoma Public Utilities - Retail	56.1	54.3	55.6	58.3	63.6	70.1	77.7
Tacoma Public Utilities - Wholesale	19.6	20.4	23.6	26.5	30.6	35.8	42.0
Pierce COOP	35.6	36.2	39.6	43.6	49.8	57.6	67.1
Kitsap Peninsula	3.6	3.8	4.3	4.8	5.5	6.4	7.5
Everett	83.7	83.8	90.4	97.0	107.2	120.0	135.5
Rest of Snohomish	5.6	5.8	6.8	7.7	8.8	10.2	12.0
King Co (Utility Supplied)	193.9	190.4	200.2	213.6	232.4	256.8	286.0
Pierce Co (Utility Supplied)	104.1	103.0	109.2	117.1	130.6	147.6	168.0
Snohomish Co (Utility Supplied)	89.3	89.7	97.2	104.7	116.0	130.3	147.6
King Co (Self-Supplied)	2.6	2.6	2.6	2.8	3.0	3.7	5.1
Pierce Co (Self-Supplied)	12.2	12.3	13.6	15.0	17.0	19.9	23.9
Snohomish Co (Self-Supplied)	4.2	4.2	4.8	5.4	6.2	7.3	8.7
King Co	196.6	193.0	203.0	216.5	235.6	260.8	291.2
Pierce Co	116.3	115.4	122.8	132.2	147.7	167.5	191.8
Snohomish Co	93.4	93.8	101.8	110.0	122.1	137.4	156.2
<b>Regional Total</b>	<b>406.4</b>	<b>402.2</b>	<b>427.6</b>	<b>458.7</b>	<b>505.4</b>	<b>565.7</b>	<b>639.2</b>

\*Note: The sub-regions are non-additive

**Table M-7 Water Demand Forecast under ECHAM\_A2 Climate Change Model Scenario**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	46.5	45.9	48.8	53.2	59.5	67.4	77.5
East King County CWSP PA	70.4	70.1	74.6	80.6	88.9	99.9	113.7
Vashon CWSP PA	0.5	0.5	0.5	0.6	0.6	0.7	0.8
Seattle Public Utilities - Retail	66.8	64.0	65.1	67.8	72.7	79.1	87.3
Seattle Public Utilities - Wholesale	81.9	80.4	84.4	90.8	99.9	112.0	127.8
King County Wastewater	208.3	205.3	217.2	233.1	257.4	288.9	329.7
Cascade Water Alliance	42.2	42.4	46.0	50.0	55.2	62.2	71.2
Tacoma Public Utilities - Retail	56.6	54.7	55.9	58.8	64.7	71.9	81.0
Tacoma Public Utilities - Wholesale	19.8	20.6	23.7	26.7	31.1	36.7	43.9
Pierce COOP	35.9	36.4	39.8	43.9	50.6	59.2	70.0
Kitsap Peninsula	3.7	3.8	4.3	4.9	5.6	6.6	7.9
Everett	84.3	84.4	90.8	97.8	109.0	123.3	141.5
Rest of Snohomish	5.7	5.8	6.8	7.7	8.9	10.5	12.5
King Co (Utility Supplied)	196.0	192.1	201.4	215.5	236.8	264.5	300.3
Pierce Co (Utility Supplied)	105.0	103.8	109.8	118.1	132.9	151.5	175.2
Snohomish Co (Utility Supplied)	90.1	90.3	97.7	105.6	118.0	133.8	154.1
King Co (Self-Supplied)	2.6	2.6	2.7	2.8	3.1	3.8	5.3
Pierce Co (Self-Supplied)	12.3	12.4	13.6	15.1	17.3	20.5	24.9
Snohomish Co (Self-Supplied)	4.3	4.3	4.8	5.4	6.3	7.5	9.2
King Co	198.7	194.7	204.1	218.4	240.0	268.6	305.8
Pierce Co	117.3	116.3	123.4	133.3	150.3	172.0	200.1
Snohomish Co	94.2	94.4	102.3	110.8	124.2	141.2	163.1
<b>Regional Total</b>	<b>410.2</b>	<b>405.4</b>	<b>429.9</b>	<b>462.5</b>	<b>514.5</b>	<b>581.7</b>	<b>669.1</b>

\*Note: The sub-regions are non-additive

**Table M-8 Water Demand Forecast under IPSL\_A2 Climate Change Model Scenario**

Sub-Region	2005	2010	2020	2030	2040	2050	2060
South King County CWSP PA	46.5	46.0	49.3	53.9	60.4	68.6	78.8
East King County CWSP PA	70.4	70.3	75.3	81.7	90.3	101.7	115.6
Vashon CWSP PA	0.5	0.5	0.5	0.6	0.6	0.7	0.8
Seattle Public Utilities - Retail	66.9	64.3	65.9	68.9	74.1	80.9	89.1
Seattle Public Utilities - Wholesale	82.1	80.8	85.4	92.3	101.8	114.5	130.4
King County Wastewater	208.8	206.3	219.7	236.9	262.4	295.3	336.4
Cascade Water Alliance	42.3	42.6	46.5	50.8	56.3	63.5	72.6
Tacoma Public Utilities - Retail	56.7	54.9	56.4	59.6	65.7	73.2	82.4
Tacoma Public Utilities - Wholesale	19.8	20.6	23.9	27.1	31.6	37.4	44.6
Pierce COOP	36.0	36.6	40.2	44.5	51.4	60.2	71.2
Kitsap Peninsula	3.7	3.8	4.4	4.9	5.7	6.8	8.0
Everett	84.3	84.7	91.5	99.0	110.7	125.5	143.9
Rest of Snohomish	5.7	5.9	6.9	7.8	9.1	10.7	12.7
King Co (Utility Supplied)	196.4	193.1	203.7	219.0	241.3	270.3	306.4
Pierce Co (Utility Supplied)	105.1	104.2	110.8	119.7	135.0	154.3	178.2
Snohomish Co (Utility Supplied)	90.1	90.6	98.5	106.9	119.9	136.3	156.7
King Co (Self-Supplied)	2.6	2.6	2.7	2.9	3.1	3.9	5.4
Pierce Co (Self-Supplied)	12.3	12.5	13.8	15.3	17.6	20.8	25.4
Snohomish Co (Self-Supplied)	4.3	4.3	4.8	5.5	6.4	7.7	9.4
King Co	199.1	195.8	206.5	222.0	244.7	274.5	312.1
Pierce Co	117.4	116.7	124.6	135.1	152.6	175.1	203.5
Snohomish Co	94.2	94.7	103.2	112.2	126.1	143.8	165.9
<b>Regional Total</b>	<b>410.7</b>	<b>407.2</b>	<b>434.2</b>	<b>469.3</b>	<b>523.4</b>	<b>593.4</b>	<b>681.4</b>

\*Note: The sub-regions are non-additive

Figure M-4 shows how water demands for these climate change scenarios compare with the baseline water demand projection. Because the climate change models produce different weather variables even in the base year, and consequently different demand forecasts, it is necessary to take this into account when interpreting the impacts of climate change on water demands.

**Figure M-4 Comparison of Water Demand Forecasts under Climate Change Scenarios**

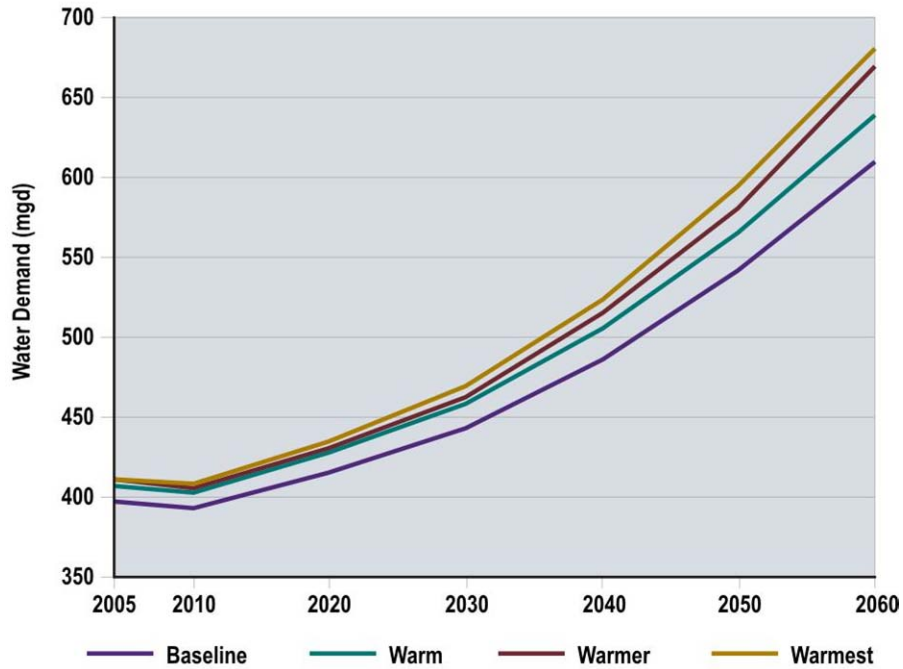
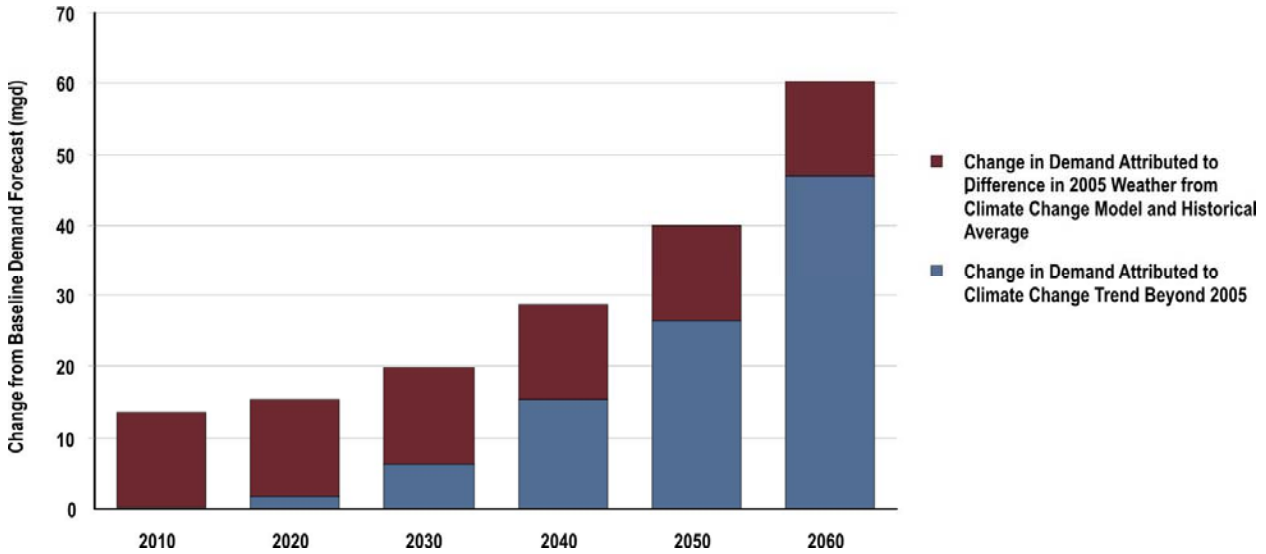


Figure M-5 presents the change in water demands due to the most significant of the three climate change models. For each climate change scenario, a portion of the change in demands is attributed to the difference in base year weather; while another portion of change in demands is attributed to the long-term climate change trend.

**Figure M-5 Change from Baseline Water Demand Forecast for Climate Change Scenarios**



As seen in these graphs, by the year 2060 approximately 10 MGD of change in demand is attributed to the fact that the climate change models predicted different weather than observed in 2005. But then the climate change models diverge significantly in terms of impact on demands due to the long-term trend in climate change. The GISS climate model's demand impact from the trend in climate is 21 MGD in 2060; while the ECHAM and IPSL scenarios have demand impacts from the trend in climate of 47 MGD and 59 MGD, respectively.