

# A brief view into Heat-wave of July 20-24th

**Table 1- Expected and Actual Maximum Temperatures For July 24 for Four Site and Region**

Average of Max Temp		Forecast For Date				
Weather Station	Forecast Filed Date	7/20/2006	7/21/2006	7/22/2006	7/23/2006	7/24/2006
Boise - Boise Air Terminal	07/20/06	100	103	105	104	103
	07/21/06		104	106	105	104
	07/22/06			107	105	100
	07/23/06				105	94
	07/24/06					102
Portland - Portland International Airport	07/20/06	95	100	98	95	90
	07/21/06		104	98	93	89
	07/22/06			93	95	90
	07/23/06				101	88
	07/24/06					97
Seattle - Seattle-Tacoma International Airport	07/20/06	87	92	89	88	84
	07/21/06		97	90	87	84
	07/22/06			96	89	84
	07/23/06				95	83
	07/24/06					92
Spokane - Spokane International Airport	07/20/06	91	98	103	102	96
	07/21/06		98	99	102	97
	07/22/06			101	100	99
	07/23/06				102	97
	07/24/06					100
Regional Average	07/21/06		96			
Regional Average	07/22/06			94		
Regional Average	07/23/06				96	
Regional Average	07/24/06					93

**Yellow highlighted temperatures are actual temperature for the day.**

**Table 2 –  
Expected and Actual Minimum Temperatures  
for July 24 for the Four Sites and Region**

Average of Min Temp		Forecast For Date				
Weather Station	Forecast Filed Date	7/20	7/21	7/22	7/23	7/24
Boise - Boise Air Terminal	07/20/06	68	68	69	71	72
	07/21/06		68	71	74	73
	07/22/06			71	73	73
	07/23/06				74	73
	07/24/06					75
Portland - Portland International Airport	07/20/06	59	64	66	66	64
	07/21/06		65	66	67	65
	07/22/06			74	67	66
	07/23/06				69	67
	07/24/06					68
Seattle - Seattle-Tacoma International Airport	07/20/06	57	62	63	64	62
	07/21/06		66	66	64	62
	07/22/06			68	64	63
	07/23/06				67	64
	07/24/06					65
Spokane - Spokane International Airport	07/20/06	57	62	66	67	66
	07/21/06		65	65	67	69
	07/22/06			65	67	70
	07/23/06				72	70
	07/24/06					68
Regional Average	07/21/06		65.7			
Regional Average	07/22/06			68.8		
Regional Average	07/23/06				69.1	
Regional Average	07/24/06					67.5

**Yellow highlighted temperatures are actual temperature for the day.**

**Table 3 - Expected and Actual Average Temperatures for July 24 for the Four Sites and Region**

Average of Avg Temp		Forecast For Date				
Weather Station	Forecast Filed Date	7/20/2006	7/21/2006	7/22/2006	7/23/2006	7/24/2006
Boise - Boise Air Terminal	07/20/06	83.8	85.3	86.9	87.5	87.1
	07/21/06		86	88.5	89.3	88.4
	07/22/06			89.0	89.1	86.4
	07/23/06				89.5	83.7
	07/24/06					88.5
Portland - Portland International Airport	07/20/06	77.2	82.0	81.9	80.4	77.1
	07/21/06		84.5	81.8	79.8	77.0
	07/22/06			83.5	81.3	78.1
	07/23/06				85	77.2
	07/24/06					82.5
Seattle - Seattle-Tacoma International Airport	07/20/06	72.0	77.3	76.1	75.6	72.9
	07/21/06		81.5	77.6	75.6	72.9
	07/22/06			82	76.6	73.8
	07/23/06				81	73.3
	07/24/06					75
Spokane - Spokane International Airport	07/20/06	74.0	79.9	84.3	84.6	81.3
	07/21/06		81.5	82.3	84.6	83.1
	07/22/06			83	83.5	84.3
	07/23/06				87	83.8
	07/24/06					84
Expected Temperature as of Actual	07/20/06		78.5	79.2	78.8	76.4
	07/21/06		80.9			
	07/22/06			81.5		
	07/23/06				82.4	
	07/24/06					80.2

Source for the temperature information: Accuweather.com from Platts' Energy Advantage

# Exploring Relationship between Regional Load and Temperature

Using daily regional load for the period 1995-2002 and average daily temperatures for four sites, as well as other explanatory variables we estimated the relationship between load and temperature for key months in Winter and Summer. In the course of our investigation we tried out various combination of explanatory variables, which included:

- Weekday vs. Weekend dummy and holiday dummy (weekend being zero)
- Year Dummy (1995-1999) value for dummy is zero. 2000-2002 it is one
- Retail electric rates
- DSI loads
- Population
- Employment
- Gross State Product
- Daylight minutes in a day
- Percent of households with Room AC (summer only)

-Table below shows the current results for the estimated relationship between daily regional load and temperature.

## Summary of Relation between Load and Temperature

	<i>Lower 95%</i>	<i>Average</i>	<i>Upper 95%</i>
<b>December days with temp &lt; 37</b>	<b>(247)</b>	<b>(336)</b>	<b>(426)</b>
<b>January days with temp &lt;38</b>	<b>(206)</b>	<b>(226)</b>	<b>(246)</b>
<b>February days with temp &lt;40</b>	<b>(197)</b>	<b>(277)</b>	<b>(358)</b>
<b>July days with Temp&gt;67</b>	<b>158</b>	<b>178</b>	<b>197</b>
<b>August days with Temp &gt;66</b>	<b>123</b>	<b>149</b>	<b>174</b>

## Cautionary note regarding this analysis and the findings

- 1- Average daily temperature is an arithmetic average of maximum and minimum temperatures for each site. We are investigating to see whether or not using the maximum daily temperature is more appropriate for use in resource adequacy analysis.
- 2- Currently we are aggregating four sites into a single average temperature for the region using weights that are a few years old. We are investigating an update to the current approach.
- 3- We are using 4 sites to represent the region. We are investigating use of hourly temperature from 20 sites and using hourly control area loads.
- 4- Using the 4 airport sites directly to estimate temp/load coefficients, as we discussed?

## Additional information

### Expected Relative Humidity

Average Relative Humidity		Forecast For Date				
Weather Station	Forecast Filed Date	7/20/2006	7/21/2006	7/22/2006	7/23/2006	7/24/2006
Boise - Boise Air Terminal	07/20/06	19.8	17.8	13.5	14.0	16.6
	07/21/06		20.7	18.7	16.6	16.6
	07/22/06			20.7	20.0	22.5
	07/23/06				19.4	35.5
Portland - Portland International Airport	07/20/06	31.4	32.0	31.7	32.5	36.4
	07/21/06		30.2	38.5	39.9	41.3
	07/22/06			38.3	42.7	41.7
	07/23/06				43.2	49.7
Seattle - Seattle-Tacoma International Airport	07/20/06	39.0	39.6	43.3	42.1	46.5
	07/21/06		38.4	48.3	47.9	50.9
	07/22/06			41.5	48.9	50.7
	07/23/06				42.1	55.5
Spokane - Spokane International Airport	07/20/06	21.4	19.2	15.9	18.1	22.1
	07/21/06		19.5	20.5	19.0	23.9
	07/22/06			20.6	21.7	21.2
	07/23/06				20.9	24.1

Source for forecasted Humidity: Accuweather.com made available through Platts' Energy Advantage