



***Weather INnovations Incorporated***



# December 2008: Temperature & Ice Wine Hours Summary

Niagara Region

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## OVERVIEW

December 2008 was colder than normal, with the coldest average daily temperatures occurring on the 7<sup>th</sup> and 8<sup>th</sup>, the 18<sup>th</sup> to the 23<sup>rd</sup>, and the 31<sup>st</sup> into the New Year. An extreme increase in temperature occurred on the 27<sup>th</sup> and 28<sup>th</sup>, with maximum daily temperatures reaching 15-17°C on both days. The warmest temperature reached in December was 17.3°C on December 27 at the Parkway station. Despite this warm spell, the average monthly temperatures across the NAWN stations were still 0.4°C to 1.0°C below the normal daily mean based on Environment Canada's 30-year normal for Vineland. This summary will examine minimum December 2008 temperatures, as well as the ice wine harvest opportunities that arose. For this report, ice wine hours are defined as instances when the average hourly temperature was between -8.0°C and -12.0°C, inclusive. Factors such as high average daily temperatures, prior to these ice wine hours, were not taken into account. Consequently, total ice wine hours reported may be higher than the number of hours that were *actually* suitable for ice wine harvesting.

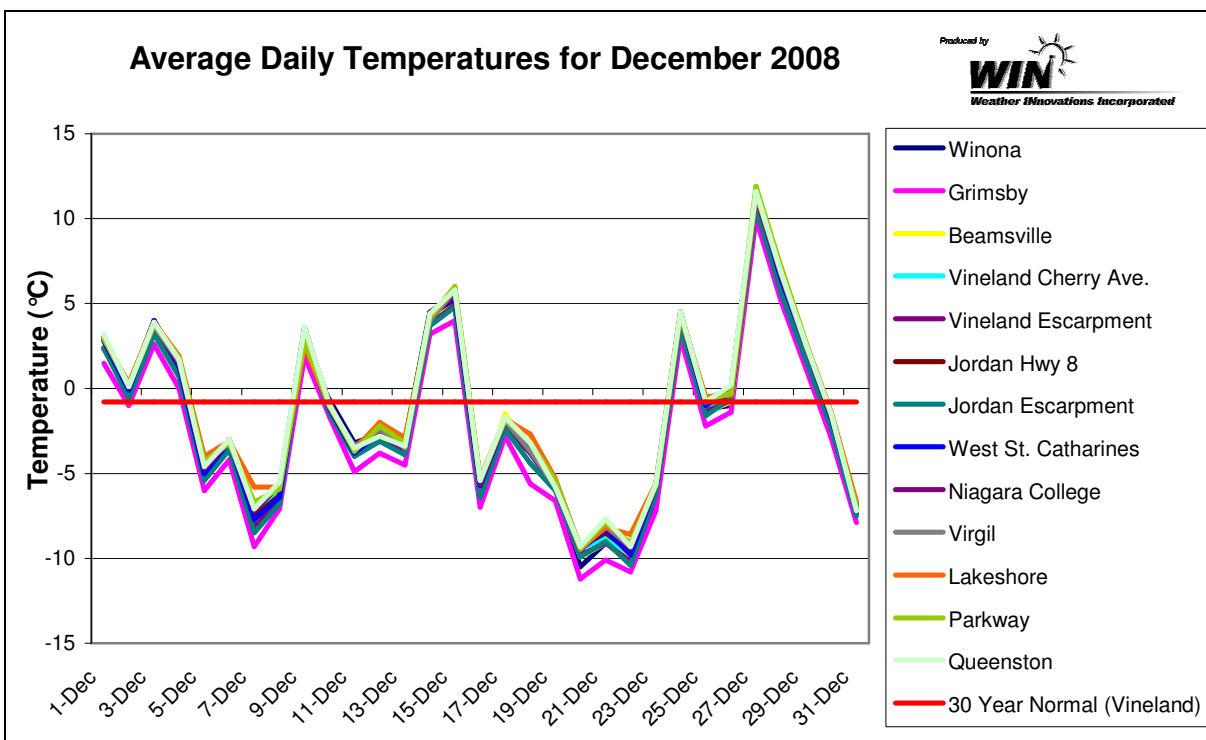


Figure 1: Average Daily Temperatures

## TEMPERATURE ANALYSIS

The extreme minimum temperatures for December 2008 ranged from  $-13.2^{\circ}\text{C}$  at the Queenston station to  $-16.0^{\circ}\text{C}$  at the Grimsby station. There were fourteen days when temperatures, at one or more stations, dipped into ice wine temperature ranges.

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### December 2008 Daily Minimums for the NAWN Stations

Date	Winona	Grimsby	Beamsville	Vineland Cherry Ave.	Vineland Escarpment	Jordan Hwy 8	West St. Catharines	Niagara College	Virgil	Lakeshore	Parkway	Queenston	
01-Dec	0.0	-1.0	-0.3	0.1	-0.3	0.2	-0.5	0.0	0.0	0.3	0.4	0.3	0.2
02-Dec	-1.0	-2.1	-1.4	-0.9	-1.3	-0.8	-1.5	-0.9	-0.8	-0.7	-0.7	-0.8	-0.6
03-Dec	-0.6	-1.6	-1.0	-0.6	-1.1	-0.6	-1.3	-0.7	-0.7	-0.6	-0.4	-0.4	-0.7
04-Dec	-4.2	-5.0	-4.2	-3.7	-4.0	-3.4	-4.1	-3.7	-3.6	-3.3	-2.3	-3.0	-3.4
05-Dec	-7.2	-10.1	-8.2	-7.6	-7.9	-7.8	-8	-7.7	-7.4	-6.6	-5.9	-6.2	-6.7
06-Dec	-6.1	-7.1	-6.5	-6.5	-6.6	-6.0	-6.6	-6.1	-5.8	-6.0	-6.0	-5.9	-5.7
07-Dec	-12.6	-15.7	-13.6	-12.5	-13.7	-12.5	-14.2	-13.4	-12.3	-12.2	-10.1	-11.9	-12.1
08-Dec	-10.8	-13.9	-12.0	-11.1	-12.0	-12.0	-12.8	-12.4	-10.7	-10.4	-9.4	-10.3	-10.0
09-Dec	-4.8	-3.3	-3.6	-3.5	-3.9	-3.5	-3.5	-3.0	-3.0	-3.2	-4.1	-4.0	-3.2
10-Dec	-4.2	-5.1	-4.1	-3.9	-4.8	-4.5	-4.7	-6.0	-5.1	-4.5	-4.0	-4.0	-4.1
11-Dec	-6.2	-10.1	-7.7	-7.8	-7.0	-6.5	-6.8	-6.8	-7.6	-6.4	-7.3	-8.4	-6.9
12-Dec	-9.0	-10.7	-9.5	-8.7	-9.3	-8.3	-9.5	-8.5	-8.6	-7.2	-6.3	-6.9	-9.8
13-Dec	-9.9	-13.3	-11.3	-9.7	-10.8	-10.4	-11	-11.0	-10.5	-10.4	-8.9	-9.9	-10.2
14-Dec	1.9	0.9	1.5	1.9	1.4	1.9	1.2	1.1	0.5	0.6	0.5	0.7	0.9
15-Dec	-5.9	-6.8	-5.8	-5.6	-5.8	-5.3	-5.8	-5.1	-5.0	-4.7	-4.6	-4.7	-4.8
16-Dec	-8.4	-9.4	-8.9	-8.1	-8.5	-7.7	-8.5	-8.1	-7.4	-6.9	-6.3	-6.8	-7.2
17-Dec	-5.2	-6.1	-5.3	-5.2	-5.4	-5.0	-5.3	-4.7	-4.9	-5.0	-5.2	-5.1	-5.0
18-Dec	-9.8	-14.4	-9.5	-10.6	-8.3	-8.9	-9.7	-9.1	-10.8	-10.7	-8.0	-9.1	-9.5
19-Dec	-10.4	-11.1	-9.7	-8.8	-9.3	-8.8	-9.5	-9.1	-9.1	-9.1	-9.0	-9.1	-8.9
20-Dec	-12.4	-12.9	-11.9	-11.1	-11.8	-12.5	-11.7	-11.5	-11.7	-11.6	-11.6	-11.7	-11.6
21-Dec	-15.1	-16.0	-14.8	-14.3	-14.7	-13.9	-14.4	-13.8	-13.6	-13.5	-13.4	-13.4	-13.2
22-Dec	-14.5	-15.6	-14.6	-14.2	-14.6	-13.9	-14.5	-13.7	-13.5	-13.4	-13.4	-13.3	-12.9
23-Dec	-12.2	-12.3	-10.5	-10.1	-10.6	-9.8	-10.6	-10.7	-9.8	-9.9	-9.6	-10.1	-9.7
24-Dec	0.2	-0.4	0.3	0.4	0.0	0.6	-0.2	0.5	0.5	0.3	0.3	0.3	0.5
25-Dec	-4.2	-5.5	-5.7	-4.0	-3.9	-3.4	-3.8	-4.5	-3.6	-2.5	-3.1	-3.2	-3.7
26-Dec	-4.7	-5.7	-5.6	-4.4	-4.5	-4.6	-4	-3.9	-3.9	-2.9	-4.2	-4.1	-3.4
27-Dec	4.8	3.0	3.8	4.2	3.8	4.4	4.2	4.7	5.2	4.7	4.6	4.2	4.9
28-Dec	1.1	0.1	0.9	1.1	0.7	1.3	0.5	1.0	1.2	1.2	1.7	1.6	1.1
29-Dec	-1.4	-2.3	-1.5	-1.2	-1.5	-1.1	-1.4	-1.0	-1.0	-0.5	-0.6	-0.5	-0.9
30-Dec	-3.3	-4.5	-3.8	-3.5	-3.9	-3.4	-4	-3.3	-3.6	-3.7	-3.7	-3.7	-3.6
31-Dec	-11	-12.2	-11.2	-10.4	-11.2	-10.5	-11.1	-10.7	-11.5	-11.6	-10.8	-11.2	-12.2

**Legend:**

	Days with Ice Wine Temperatures
	Extreme Monthly Minimum

Figure 2: Daily Minimum Temperatures



## ICE WINE HOURS ANALYSIS

As can be seen in Figure 3, all of the NAWN stations accumulated significantly more ice wine hours in December 2008, as compared to December 2007 and 2006. The 13 NAWN stations recorded between 84 and 144 ice wine hours. As per usual, the western portion of the Niagara peninsula received greater ice wine hours than the eastern half. Interestingly, in the previous two years, when the hours between  $-9^{\circ}\text{C}$  and  $-12^{\circ}\text{C}$  were examined, there were very few hours accumulated. However, December 2008 still shows a large number of ice wine hours between these temperatures. Thus, there were a reasonable number of suitable hours for harvesting grapes for ice wine this December. This can be seen in Figure 4.

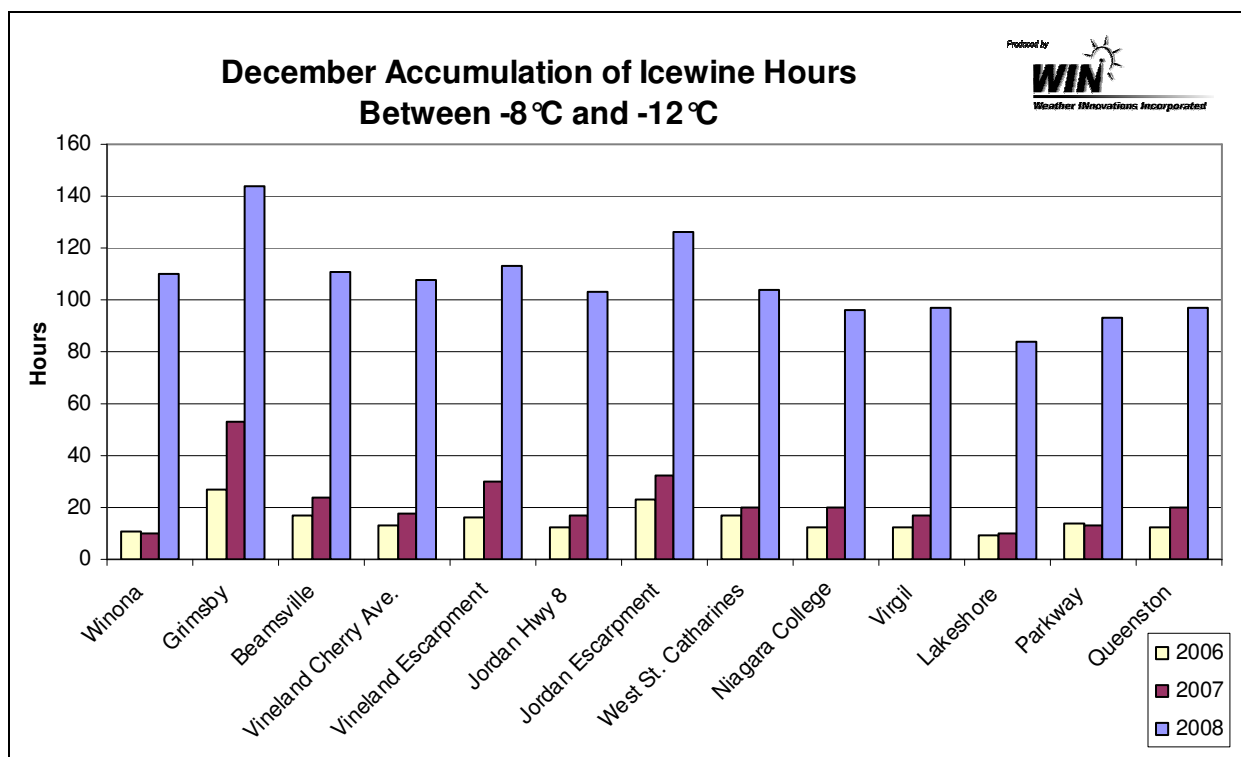
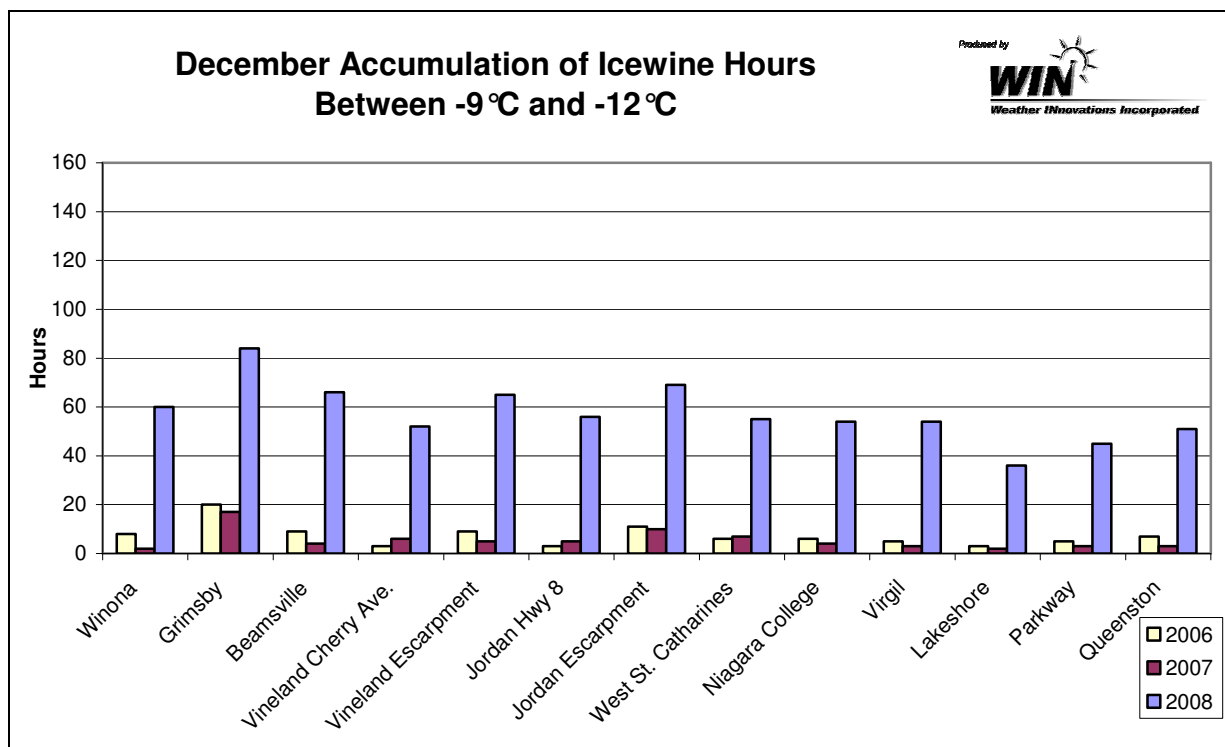


Figure 3: Hours Between  $-8^{\circ}\text{C}$  and  $-12^{\circ}\text{C}$



**Figure 4: Hours Between -9°C and -12°C**

The ice wine hours between -8°C and -12°C were accumulated during 8 ice wine “opportunities” in December. Although not all of these would be suitable for grape harvesting, due to factors such as preceding warmer daily temperatures. These opportunities are shown explicitly in the following tables. The most harvesting in December would have taken place on the 7<sup>th</sup> to the 8<sup>th</sup> and the 19<sup>th</sup> to the 23<sup>rd</sup>.



Date/ Time	Winona	Grimsby	Beamsville	Vineland Cherry Ave.	Vineland Escarpment	Jordan Hwy 8	Jordan Escarpment	West St. Catharines	Niagara College	Virgil	Lakeshore	Parkway	Queenston
<b>Possible Icewine Opportunity #1: Dec 5</b>													
12/5 16:00	-3.5	-4.2	-3.4	-3.1	-3.8	-3.3	-3.9	-3.4	-3	-2.7	-2.7	-2.7	-2.9
12/5 17:00	-4.8	-5.5	-4.7	-4.3	-4.7	-4.2	-4.8	-4.3	-4.1	-3.9	-3.5	-3.8	-4.1
12/5 18:00	-6	-7.1	-6.3	-5.9	-5.9	-5.3	-6.1	-5.5	-5.2	-5	-3.9	-4.6	-5.3
12/5 19:00	-6.9	-9.1	-8	-7.5	-6.8	-7	-6.8	-7.1	-7	-5.6	-4.2	-5.6	-6
12/5 20:00	-6.7	-8.9	-7.9	-7.4	-7.5	-7.7	-7.8	-7.7	-6.4	-6.2	-5.4	-5.8	-6.2
12/5 21:00	-5.8	-6.7	-6.5	-6.1	-6.3	-6.4	-6.4	-6.5	-5.4	-5.6	-5.4	-5.4	-5.2
12/5 22:00	-5.4	-6.4	-6	-5.7	-5.9	-5.7	-6	-5.9	-5.6	-5.2	-5	-4.9	-5.1
12/5 23:00	-5.3	-6.8	-6.1	-5.8	-6.2	-5.7	-6.4	-5.9	-5.8	-5.5	-5.5	-5.4	-5.6
<b>Possible Icewine Opportunity #2: Dec 7-8</b>													
12/7 6:00	-4.1	-5.1	-4.3	-3.7	-4.3	-3.7	-4.4	-3.8	-3.3	-3.1	-2.4	-2.7	-3.2
12/7 7:00	-5.3	-6.2	-5.1	-4.6	-5.1	-4.5	-5.2	-4.6	-4.5	-5.1	-4.1	-4.4	-4.8
12/7 8:00	-6.3	-7.3	-6.2	-6	-6.4	-5.9	-6.6	-6	-5.8	-6	-5.1	-5.5	-6
12/7 9:00	-7.2	-8.2	-7.2	-6.7	-7.3	-6.6	-7.5	-6.8	-6.2	-6	-5.5	-5.9	-6.1
12/7 10:00	-7.5	-8.5	-7.5	-7	-7.4	-6.8	-7.7	-6.9	-6.4	-6.4	-6.1	-6.4	-6.4
12/7 11:00	-7.6	-8.4	-7.8	-7.3	-7.8	-7.2	-8.1	-7.2	-6.8	-6.8	-6.6	-6.9	-6.9
12/7 12:00	-7.7	-8.4	-7.9	-7.5	-7.8	-7.4	-8.3	-7.6	-7.1	-7.2	-7	-7.2	-7
12/7 13:00	-8.2	-9	-7.8	-7.7	-8.2	-7.5	-8.7	-7.9	-7.2	-7.4	-7.2	-7.3	-7.2
12/7 14:00	-8.3	-9.4	-8.2	-8.1	-8.5	-8	-8.9	-8.2	-7.4	-7.7	-7.4	-7.3	-7.8
12/7 15:00	-8.6	-9.8	-8.8	-8.4	-8.9	-8.4	-9.2	-8.6	-7.8	-8	-7.8	-7.7	-8.2
12/7 16:00	-9.3	-10.5	-9.4	-8.7	-9.3	-9	-9.7	-9.2	-8.4	-8.3	-8.3	-8.1	-8.6
12/7 17:00	-10.6	-11.8	-10.9	-9.9	-10.7	-9.9	-11	-10	-8.8	-8.6	-8.2	-8.3	-9
12/7 18:00	-11.7	-13.5	-12.1	-11.6	-12.2	-11.3	-12.4	-11.5	-10.4	-9.1	-8.5	-8.6	-9.7
12/7 19:00	-12.1	-14.3	-12.8	-12.2	-12.9	-11.9	-12.9	-12.3	-11.8	-10.6	-8.9	-9.8	-11.3
12/7 20:00	-12.4	-14.8	-13.1	-12.1	-13.4	-12.1	-13.2	-12.5	-12	-11.2	-9.3	-10.7	-11.5
12/7 21:00	-12.4	-15.2	-13.5	-12.2	-13.5	-12.1	-13.9	-12.3	-12.1	-11.9	-8	-11.5	-12
12/7 22:00	-11.9	-15.6	-13.1	-12.2	-13	-12	-14.1	-12.7	-12	-11.8	-7.5	-11.7	-11.6
12/7 23:00	-11.2	-14.7	-12.6	-11.3	-12.7	-12	-13.7	-13	-11.2	-10.9	-7.2	-10.8	-11.2
12/8 0:00	-10.9	-13.7	-12.2	-10.8	-12.1	-11.2	-12.7	-11.4	-11	-10.8	-7.7	-10.5	-10.4
12/8 1:00	-10.8	-13.6	-11.9	-10.6	-11.7	-11	-12.7	-11.1	-10.6	-10.1	-9.1	-10.1	-9.7
12/8 2:00	-10.6	-12.9	-11.7	-11	-11.7	-11.7	-12.6	-11.9	-10.2	-9.9	-8.7	-9.3	-9.3
12/8 3:00	-10.3	-12.2	-11.4	-10.8	-11.3	-11.9	-12.4	-12.1	-10.1	-9.1	-8.2	-8.7	-9
12/8 4:00	-9.5	-11.4	-11.4	-10.1	-10.9	-11.4	-12	-11.8	-9.5	-9.1	-8.3	-8.2	-8.6
12/8 5:00	-8.8	-10.9	-10.7	-9	-10.1	-10.5	-11	-11.4	-9.1	-8.8	-8.8	-8.4	-8.6
12/8 6:00	-8.7	-10.4	-10.4	-8.7	-10	-9.6	-10.5	-10.7	-9.4	-8.7	-8.7	-8.9	-8.6
12/8 7:00	-8.5	-10.2	-9	-8.6	-9.3	-9.5	-10.1	-10.1	-9.2	-8.9	-9.1	-9.4	-8.6
12/8 8:00	-7.9	-9.9	-8.7	-8.5	-8.9	-9.3	-9.5	-9.6	-8.8	-8.8	-9.1	-9.3	-8.7
12/8 9:00	-7	-8.4	-8.3	-8	-8.4	-8.2	-8.6	-8.2	-7.8	-7.7	-8.3	-8.5	-8
12/8 10:00	-6.6	-7.6	-6.8	-6.7	-7	-6.7	-7.4	-6.9	-6.6	-6.5	-6.8	-7	-6.8
12/8 11:00	-5.7	-6.4	-5.7	-5.8	-6.2	-5.7	-6.4	-5.4	-5.1	-5.1	-5.5	-5.5	-5.1
12/8 12:00	-5.1	-5.8	-5	-5.1	-5.7	-5.2	-5.9	-4.9	-4.5	-4.5	-4.4	-4.4	-4.1
12/6 11:00	-3.8	-4.5	-3.9	-3.7	-4.1	-3.7	-4.2	-3.3	-3.5	-3.3	-3.6	-3.5	-3.4

Legend:   Ice Wine Temperatures  
  Below Ice Wine Temperatures

Figure 5: Hourly Temperatures





Date/ Time	Winona	Grimsby	Beamsville	Vineland Cherry Ave.	Vineland Escarpment	Jordan Hwy 8	Jordan Escarpment	West St. Catharines	Niagara College	Virgil	Lakeshore	Pathway	Queenston
<b>Possible Icewine Opportunity #3: Dec 11</b>													
12/11 1:00	-4	-5.4	-4.3	-3.9	-4.4	-3.8	-4.4	-4	-4.6	-3.9	-3.8	-4.4	-4.9
12/11 2:00	-3.8	-5.3	-4.6	-3.9	-4.6	-4.2	-5	-5.6	-7	-5.7	-5.8	-6.6	-6.3
12/11 3:00	-3.9	-6.3	-5.9	-5.3	-6	-6.1	-5.9	-6.6	-6.9	-5.7	-6.3	-6.3	-6.2
12/11 4:00	-5.2	-8.8	-6.8	-6.7	-6.5	-6.4	-6.4	-6.3	-5.7	-5.4	-5.7	-5.7	-5.3
12/11 5:00	-5.6	-9.6	-7.3	-6.5	-6.5	-6.1	-5.9	-6	-5.6	-4.9	-5.5	-5.5	-5.3
12/11 6:00	-6.1	-9.8	-7.5	-7.7	-6.8	-6.3	-6.2	-5.9	-5.2	-4.7	-5.6	-5.8	-5.1
12/11 7:00	-6	-9.8	-6.8	-7	-6.5	-6	-6.1	-5.5	-4.9	-5.1	-6.2	-6.9	-5.4
12/11 8:00	-5.4	-9.1	-6.7	-6.3	-5.9	-6.1	-6.5	-6.1	-6.2	-6	-7	-8.3	-6.8
12/11 9:00	-3.9	-7	-5.8	-6	-5.4	-5.9	-6.1	-5.8	-5.7	-5.7	-6.2	-6.8	-6.1
12/11 10:00	-2.6	-3.9	-3.7	-3.6	-3.8	-3.9	-4.4	-4.7	-3.5	-4	-4.1	-3.9	-3.3
12/11 11:00	-1.8	-2.2	-2.1	-2.3	-2.8	-2.8	-3.7	-3.5	-3.1	-3.1	-2.8	-2.7	-2.3
<b>Possible Icewine Opportunity #4: Dec 12-13</b>													
12/12 19:00	-4	-5.1	-4	-3.4	-4	-3.3	-4.2	-3.5	-3.9	-4	-3.8	-4	-4.1
12/12 20:00	-5.3	-6.6	-5.3	-4.4	-5	-4.2	-5	-4.3	-4	-4.2	-4.1	-4.3	-4.5
12/12 21:00	-6.5	-7.8	-6.8	-5.7	-6.5	-5.5	-6.5	-5.6	-5	-4.9	-4.9	-5	-5.3
12/12 22:00	-7.6	-8.8	-7.7	-6.8	-7.4	-6.7	-7.6	-6.6	-6.2	-6.4	-5.9	-6.2	-6.7
12/12 23:00	-8.3	-9.5	-8.4	-8.2	-8.1	-7.4	-8.5	-7.8	-7	-7	-6.3	-6.7	-8.2
12/13 0:00	-8.9	-10.5	-9.1	-8.5	-8.8	-7.9	-9.2	-8.4	-7.8	-7.1	-6.3	-6.8	-9.1
12/13 1:00	-9.1	-10.9	-9.6	-9.1	-9.1	-8.4	-9.5	-8.8	-8.9	-8.1	-6.3	-6.8	-9.4
12/13 2:00	-9.6	-12.6	-10.6	-9.4	-10	-9.3	-10.5	-10.1	-9.6	-9.2	-6.5	-7.7	-9.1
12/13 3:00	-9.4	-11.9	-9.9	-9.3	-10	-9.8	-10.5	-10.7	-10.1	-10.1	-6.7	-9.6	-10
12/13 4:00	-8.9	-10.8	-10.2	-9.6	-10.5	-9.9	-10.6	-10.4	-9.2	-9	-8	-9.1	-8.9
12/13 5:00	-7.8	-9.1	-9	-8.1	-9.2	-8.8	-9.5	-9.4	-9.5	-9.6	-8.7	-8.7	-8.9
12/13 6:00	-7	-8.2	-8	-7.1	-8	-7.7	-8.2	-7.4	-7.5	-8	-8	-8.2	-7.3
12/13 7:00	-6.2	-7.4	-7.3	-6.3	-7.1	-6.7	-7.3	-7	-6.5	-6.4	-6.6	-7	-6.6
12/13 8:00	-6.5	-9	-8.3	-6.6	-7.8	-7.2	-7.9	-7.7	-6.8	-6.9	-6.2	-6.4	-6.8
12/13 9:00	-6.2	-7.5	-7.7	-6.1	-7	-6.6	-7.1	-6.3	-6.5	-6.5	-5.6	-6.4	-6.2
12/13 10:00	-4.3	-5.1	-4.6	-4	-4.6	-3.7	-5	-3.5	-4.3	-4.3	-3.3	-3.6	-4
12/13 11:00	-2.6	-3.5	-2.2	-2.4	-2.7	-2.2	-3.5	-1.6	-3.1	-3.3	-2.2	-2.2	-3.1
<b>Possible Icewine Opportunity #5: Dec 16</b>													
12/16 3:00	-6.8	-7.7	-6.8	-6.5	-6.9	-6.3	-6.9	-6.3	-6.3	-5.8	-5.5	-5.5	-6
12/16 4:00	-6.9	-7.9	-7.1	-6.9	-7.2	-6.6	-7	-6.5	-6.4	-5.9	-5.7	-5.8	-6.2
12/16 5:00	-7.3	-8.3	-7.3	-6.9	-7.3	-6.7	-7.2	-6.7	-6.6	-6.3	-5.8	-5.9	-6.4
12/16 6:00	-7.6	-8.5	-7.7	-7.2	-7.7	-7.1	-7.7	-7.1	-6.9	-6.2	-6.2	-6.2	-6.6
12/16 7:00	-8.2	-9.2	-8.3	-7.7	-8.1	-7.4	-8.2	-7.6	-7.2	-6.6	-6.2	-6.6	-7
12/16 8:00	-8.3	-9.3	-8.8	-8	-8.4	-7.7	-8.4	-7.9	-7.3	-6.8	-6.1	-6.7	-7.1
12/16 9:00	-7.4	-8.5	-8.2	-7.6	-7.9	-7.4	-8	-7.6	-7.2	-6.8	-6	-6.7	-6.9
12/16 10:00	-6.8	-7.8	-6.7	-6.5	-7	-6.6	-7.3	-6.7	-6.4	-5.9	-5.7	-5.8	-6.2
12/16 11:00	-6.3	-7.1	-5.8	-6.1	-6.3	-6	-6.7	-6	-5.6	-5.4	-5.4	-5.3	-5.5

Legend: 

	Ice Wine Temperatures
	Below Ice Wine Temperatures

Figure 6: Hourly Temperatures



Date/ Time	Winona	Grimsby	Beamsville	Vineland Cherry Ave.	Vineland Escarpment	Jordan Escarpment	Jordan Hwy 8	West St. Catharines	Niagara College	Virgil	Lakeshore	Parkway	Queenston
<b>Possible Icewine Opportunity #6: Dec 18</b>													
12/18 17:00	-3.7	-5.2	-4.8	-4	-4.3	-3.2	-4.6	-3.5	-3	-3.6	-2.2	-2.8	-3.3
12/18 18:00	-4.9	-7.5	-5.6	-5.5	-5.3	-4.2	-6.2	-4.7	-3.8	-4.1	-4	-3.5	-4.4
12/18 19:00	-6.3	-8.6	-5.6	-6	-5.8	-4.9	-7.1	-5.9	-4.2	-5.1	-5	-4.7	-4.5
12/18 20:00	-7	-10.8	-6.2	-7.8	-6.5	-7.2	-8.2	-6.7	-5.1	-6.5	-5.2	-5.6	-4.9
12/18 21:00	-8.4	-13.3	-8.7	-9.3	-7.8	-8.4	-8.6	-7.2	-7.4	-8.2	-6.6	-6.4	-6
12/18 22:00	-9.6	-13.9	-6.9	-8.5	-7.4	-8.7	-8.4	-8.2	-10.1	-10	-7.7	-8.3	-8.5
12/18 23:00	-7.9	-13.2	-6	-6.7	-6.6	-8.3	-9.4	-8.4	-8.7	-9.8	-3.5	-7.5	-7.9
12/19 0:00	-5.4	-9.4	-5.4	-5.4	-5.1	-7.6	-8.5	-7.3	-6.2	-6.5	-3.1	-5.9	-5.6
12/19 1:00	-4.8	-6.4	-5.2	-4.9	-5.3	-5.9	-6.8	-6.4	-5.2	-5.4	-3.2	-4.3	-5.1
12/19 2:00	-4.9	-6.2	-4.9	-4.3	-5.3	-5.4	-5.9	-6.2	-4.9	-5	-3.5	-4.1	-5.1
<b>Possible Icewine Opportunity #7: Dec 19-23</b>													
12/19 17:00	-6.5	-7.4	-6.6	-6.2	-6.7	-6.4	-6.9	-6.5	-6.8	-6.5	-6.2	-6.4	-6.7
12/19 18:00	-6.8	-7.6	-6.9	-6.3	-6.7	-6.2	-6.8	-6.4	-6.7	-6.5	-6.2	-6.4	-6.6
12/19 19:00	-8	-8	-7.3	-6.8	-7.3	-6.7	-7.3	-6.9	-7.1	-7.1	-6.7	-6.9	-6.9
12/19 20:00	-8.7	-9.2	-7.7	-7.3	-7.7	-7.3	-7.8	-7.4	-7.6	-7.5	-7.1	-7.3	-7.6
12/19 21:00	-8.6	-8.9	-8.1	-7.6	-8.1	-7.6	-8.2	-7.5	-7.8	-7.7	-7.6	-7.6	-7.9
12/19 22:00	-9.5	-10.1	-8.2	-7.8	-8.4	-8	-8.5	-8.1	-8.4	-8.3	-8	-8.2	-8.5
12/19 23:00	-10	-10.8	-8.8	-8.2	-8.8	-8.3	-8.8	-8.6	-8.8	-8.6	-8.3	-8.4	-8.7
12/20 0:00	-10.2	-11.1	-9.6	-8.7	-9.1	-8.7	-9.3	-8.9	-8.9	-8.9	-8.9	-8.8	-8.8
12/20 1:00	-10.8	-11.2	-10.1	-9.4	-9.7	-9	-9.6	-9.3	-9.6	-9.6	-9.4	-9.5	-9.2
12/20 2:00	-11	-11.4	-10.4	-9.8	-10.1	-9.4	-10	-9.6	-9.9	-9.9	-9.6	-9.7	-9.8
12/20 3:00	-11.1	-11.5	-10.4	-9.8	-10.2	-9.5	-10.1	-9.8	-10	-9.9	-9.7	-9.7	-10
12/20 4:00	-11.1	-11.5	-10.4	-9.7	-10.2	-9.7	-10.2	-9.9	-10.1	-10	-9.6	-9.8	-10.1
12/20 5:00	-11.4	-12	-10.6	-9.9	-10.3	-9.6	-10.2	-9.8	-10.2	-10	-9.6	-9.8	-10.1
12/20 6:00	-11.9	-12.5	-11.2	-10.5	-10.7	-9.9	-10.4	-10	-10.2	-10.2	-10.2	-10.1	-10.1
12/20 7:00	-11.9	-12.5	-11.2	-10.6	-11.1	-10.4	-10.8	-10.3	-10.5	-10.5	-10.4	-10.4	-10.3
12/20 8:00	-11.5	-12.3	-10.9	-10.4	-11.1	-10.3	-10.9	-10.5	-10.6	-10.5	-10.2	-10.2	-10.5
12/20 9:00	-11.3	-11.9	-10.5	-10.1	-10.5	-10.1	-10.6	-10.3	-10.3	-10	-9.9	-9.8	-10.1
12/20 10:00	-11.2	-11.6	-9.8	-9.6	-9.6	-9.4	-9.7	-9.4	-9.3	-9.2	-9.4	-9.3	-9.4
12/20 11:00	-11.7	-11.3	-9.2	-9	-9	-8.4	-9.7	-8.6	-8.6	-9.1	-8.9	-8.8	-8.6
12/20 12:00	-12.2	-12.1	-7.8	-8.4	-8.2	-6.7	-8	-7.8	-8.5	-8.3	-8.5	-8.1	-7.8
12/20 13:00	-11.5	-12.4	-9.1	-7.3	-7.2	-7	-8.3	-8	-6.7	-7.9	-8.3	-7.2	-6.9
12/20 14:00	-10.3	-11	-6.8	-7.3	-7.4	-7.2	-8.3	-7.7	-7	-7.3	-7.9	-7.1	-6.6
12/20 15:00	-9.6	-9.6	-7.6	-8.1	-8.1	-8	-8.6	-7.9	-8.1	-7.9	-8.2	-7.8	-7.6
12/20 16:00	-8.1	-9.1	-8.7	-8.4	-8.7	-8.4	-8.9	-8.5	-8.4	-8.7	-8.6	-8.5	-8.4
12/20 17:00	-8.1	-9.7	-9.2	-8.8	-9.3	-9	-9.7	-9.3	-9.4	-9.4	-9.1	-9.2	-9.4
12/20 18:00	-9.2	-10.5	-9.9	-9.5	-10.1	-9.8	-10.7	-10.3	-10	-9.8	-9.5	-9.6	-9.9
12/20 19:00	-9.7	-11	-10.7	-10.2	-11.1	-11.1	-11.1	-11.2	-11.2	-11	-10.5	-10.8	-11.1
12/20 20:00	-9.9	-11.7	-11.8	-10.7	-11.7	-12	-11.7	-11.3	-11.3	-11.5	-11.4	-11.5	-11.5

**Legend:**

	Ice Wine Temperatures
	Below Ice Wine Temperatures

Figure 7: Hourly Temperatures

Date/ Time	Winona	Grimsby	Beamsville	Vineland Cherry Ave.	Vineland Escarpment	Jordan Hwy 8	West St. Catharines	Niagara College	Virgil	Lakeshore	Parkway	Queenston	
12/20 21:00	-10.1	-11.7	-11.5	-11	-11.6	-11.4	-11.2	-10.6	-10.7	-10.9	-10.7	-11	-10.3
12/20 22:00	-10.1	-11.3	-10.6	-9.9	-10.6	-10.1	-10.2	-9.8	-9.6	-9.4	-9.9	-9.9	-9.2
12/20 23:00	-9.2	-10.2	-9.6	-8.9	-9.5	-9.1	-9.4	-8.9	-9	-8.6	-8.9	-8.8	-8.7
12/21 0:00	-8.5	-9.8	-9.2	-8.6	-9.2	-8.7	-9.3	-8.7	-8.6	-8.3	-8.4	-8.4	-8.6
12/21 1:00	-8.3	-9.7	-9.1	-8.6	-9.2	-8.8	-9.3	-8.8	-8.8	-8.7	-8.7	-8.7	-8.8
12/21 2:00	-8.6	-9.9	-9.2	-8.8	-9.4	-8.9	-9.2	-8.7	-8.9	-9	-8.9	-8.9	-8.8
12/21 3:00	-8.5	-10	-9.4	-9	-9.5	-8.9	-9.5	-8.8	-8.7	-8.9	-9	-8.9	-8.8
12/21 4:00	-8.7	-10	-9.6	-9.4	-9.5	-9	-9.5	-9	-8.9	-9.3	-9.3	-9.2	-9.1
12/21 5:00	-8.8	-9.9	-9.5	-9.2	-9.5	-9	-9.4	-8.8	-8.6	-8.8	-8.9	-8.5	-8.2
12/21 6:00	-8.6	-9.6	-9.5	-9.1	-9.5	-9.1	-9.3	-8.5	-7.9	-7.8	-8.3	-8	-7.5
12/21 7:00	-8.4	-9.5	-8.8	-8.9	-8.7	-8.6	-8.2	-7.6	-6.1	-6.6	-7.5	-7.3	-6.6
12/21 8:00	-8.3	-8.9	-7	-8.6	-6.7	-7.2	-5	-4.7	-4.1	-4	-6.5	-5	-3.7
12/21 9:00	-6.4	-6.7	-4.8	-4.4	-4.3	-3.4	-3.6	-2.6	-2.2	-2.5	-4.2	-2.6	-1.7
12/21 10:00	-4.5	-5.1	-3.8	-3.6	-3.8	-3.2	-4.2	-3.1	-3.1	-3.4	-2.9	-3	-2.7
12/21 11:00	-3.2	-4	-2.9	-2.9	-3	-2.5	-3.5	-2.4	-2.5	-2.9	-2.3	-2.4	-2.1
12/21 12:00	-2.4	-3.3	-2.3	-2.3	-2.5	-1.9	-3.2	-2	-2.1	-2.7	-2.1	-1.9	-1.8
12/21 13:00	-3.4	-5	-3.7	-3.3	-3.7	-3	-3.9	-3.4	-2.7	-2.9	-2.4	-2.3	-2.4
12/21 14:00	-5.8	-7.2	-6.2	-5.8	-6.2	-5.3	-6.4	-5.5	-5.1	-5.1	-4.5	-4.3	-4.2
12/21 15:00	-7.9	-9.1	-8.1	-7.8	-8.1	-7.1	-8.3	-7.4	-7.1	-7	-6.8	-6.4	-6.3
12/21 16:00	-9.4	-10.4	-9.2	-8.8	-9.4	-8.7	-9.5	-8.7	-8.3	-8.3	-8.1	-7.9	-8.1
12/21 17:00	-10.9	-11.8	-10.7	-10.2	-10.7	-10	-10.7	-10	-9.9	-9.7	-9.5	-9.4	-9.4
12/21 18:00	-11.8	-12.8	-11.7	-11.2	-11.6	-10.9	-11.6	-11	-10.9	-10.5	-10.4	-10.3	-10.4
12/21 19:00	-12.6	-13.7	-12.7	-12.2	-12.7	-12	-12.6	-11.9	-11.7	-11.5	-11.5	-11.3	-11.3
12/21 20:00	-13.5	-14.5	-13.4	-12.8	-13.3	-12.5	-13.1	-12.5	-12.5	-12.3	-12.2	-12.1	-12
12/21 21:00	-14	-14.9	-13.8	-13.4	-13.8	-13.1	-13.7	-13.1	-13	-12.8	-12.8	-12.7	-12.7
12/21 22:00	-14.5	-15.4	-14.2	-13.8	-14.2	-13.5	-14.1	-13.4	-13.4	-13.2	-13.1	-13.1	-13.1
12/21 23:00	-15.1	-15.9	-14.6	-14.1	-14.5	-13.7	-14.3	-13.7	-13.6	-13.4	-13.4	-13.3	-13.2
12/22 0:00	-15	-15.9	-14.8	-14.3	-14.6	-13.8	-14.2	-13.6	-13.3	-13.2	-13.3	-13.2	-13
12/22 1:00	-14.2	-15.2	-14.4	-13.9	-14.4	-13.7	-14.3	-13.6	-13.4	-13.3	-13.3	-13.2	-12.9
12/22 2:00	-13.5	-14.5	-13.4	-13	-13.4	-12.8	-13.3	-13	-12.9	-12.8	-11.9	-12.6	-12.6
12/22 3:00	-13.3	-14.5	-13.4	-13	-13.3	-12.5	-13	-12.1	-12.2	-12.4	-12	-12.2	-12.1
12/22 4:00	-12.6	-13.8	-12.9	-12.6	-13	-12.4	-12.8	-12.4	-12.3	-12.2	-12	-12.2	-12.1
12/22 5:00	-12	-13.2	-12.3	-12	-12.4	-11.8	-12.3	-11.8	-11.7	-11.4	-9.8	-11.6	-11.6
12/22 6:00	-11.6	-12.9	-12.2	-11.7	-12.3	-11.7	-12.2	-11.6	-11.4	-10.4	-8.4	-9.4	-11.1
12/22 7:00	-11.4	-12.8	-12.1	-11.3	-12.2	-11.5	-12	-11.5	-10.8	-9.6	-8.8	-9.2	-10
12/22 8:00	-12.4	-12.9	-11.8	-11.2	-11.7	-11.1	-11.9	-11.3	-10.9	-10.2	-9.2	-9.7	-10.4
12/22 9:00	-11.2	-11.9	-11.5	-10.8	-11.4	-10.8	-11.9	-11.1	-10.3	-10.2	-9.1	-9.6	-10.4
12/22 10:00	-10	-10.7	-10.2	-9.8	-10.5	-9.9	-11.4	-10.5	-9.6	-9.4	-8.8	-9.1	-9.5
12/22 11:00	-8.5	-9	-8.5	-9	-9.4	-8.7	-9.8	-9.2	-8.4	-8.7	-8.2	-8.6	-8.8
12/22 12:00	-7.8	-8.3	-6.7	-7.8	-8	-7.5	-8.6	-8.1	-7.5	-8.1	-7.7	-8	-7.9

Legend:

	Ice Wine Temperatures
	Below Ice Wine Temperatures

Figure 8: Hourly Temperatures



Date/ Time	Winora	Grimsby	Beamsville	Vineland Cherry Av.	Vineland Escarpment	Jordan Hwy 8	Jordan Escarpment	West St. Catharines	Niagara College	Virgil	Lakeshore	Parkway	Queenston
12/22 13:00	-7	-7.6	-6.4	-7	-7.4	-7.1	-8	-7.2	-6.8	-7.4	-7	-7.4	-7.4
12/22 14:00	-6.1	-7.5	-6.9	-7	-7.2	-6.6	-7.9	-6.9	-6.6	-7.1	-6.6	-6.9	-6.8
12/22 15:00	-6.7	-7.6	-6.9	-6.5	-7.2	-6.5	-7.8	-7	-6.4	-6.7	-6.4	-7.2	-6.8
12/22 16:00	-7.2	-7.8	-7	-7	-7.5	-6.9	-7.8	-7.4	-6	-6.4	-5.7	-6.3	-6.4
12/22 17:00	-7.9	-9	-8.3	-7.7	-8.6	-7.8	-9	-8.1	-7.5	-6.9	-5.9	-6.5	-7.1
12/22 18:00	-8.5	-9.5	-9.2	-8.7	-9.5	-8.7	-10.4	-9.5	-8.9	-8.4	-7.1	-8.1	-8.6
12/22 19:00	-8.9	-10.2	-9.4	-8.8	-9.7	-9.1	-10.1	-9.4	-9.4	-9.1	-7.4	-8.4	-9.4
12/22 20:00	-10	-10.9	-10	-9.7	-10.2	-9.8	-10.6	-10.3	-9.6	-9.5	-8.7	-9.1	-9.6
12/22 21:00	-9.3	-10.3	-9.4	-8.8	-9.3	-8.8	-9.3	-9.2	-9.2	-9.4	-9.4	-9.4	-9.4
12/22 22:00	-8.8	-9.8	-8.9	-8.5	-8.9	-8.4	-9	-8.5	-8.2	-8.1	-8.1	-8.4	-8.2
12/22 23:00	-8.7	-9.6	-8.5	-8	-8.6	-8.1	-8.5	-8.1	-7.8	-7.8	-7.9	-7.8	-7.8
12/23 0:00	-8.8	-9.9	-8.7	-8.2	-8.6	-8	-8.7	-8.1	-7.7	-7.6	-7.6	-7.7	-7.6
12/23 1:00	-9.5	-10.4	-9.3	-8.6	-9.2	-8.5	-9.1	-8.6	-8	-7.8	-7.9	-7.8	-7.9
12/23 2:00	-9.5	-10.4	-9.3	-8.9	-9.2	-8.5	-9.2	-8.6	-8.2	-7.9	-7.9	-7.9	-8
12/23 3:00	-9.1	-10.1	-9.3	-8.9	-9.4	-8.8	-9.5	-8.9	-8.7	-8.5	-7.5	-8.2	-8.6
12/23 4:00	-9.7	-9.9	-9.1	-8.8	-9.3	-8.8	-9.5	-9	-9.1	-8.7	-7.5	-8.3	-9
12/23 5:00	-10.7	-10.7	-9.4	-9	-9.5	-8.9	-9.8	-9.4	-9.2	-9	-8.3	-8.8	-9.2
12/23 6:00	-11.4	-11.5	-9.8	-9.4	-10	-9.4	-10.3	-10.1	-9.8	-9.7	-8.9	-9.4	-9.6
12/23 7:00	-12.1	-12.3	-10.4	-10	-10.4	-9.7	-10.4	-10.3	-9.5	-9.5	-9.5	-9.7	-9.3
12/23 8:00	-12	-12	-10.4	-9.8	-10.2	-9.6	-10.1	-9.7	-9	-9.1	-9.4	-9.2	-8.9
12/23 9:00	-11	-11.2	-9.9	-9.4	-9.8	-9.1	-9.7	-9.1	-8.7	-8.6	-8.9	-8.7	-8
12/23 10:00	-9.7	-10.1	-9	-8.6	-9	-8.2	-8.8	-7.9	-7.2	-7.6	-8.2	-8.1	-6.9
12/23 11:00	-8.2	-8.4	-7	-7	-6.9	-5.9	-6.6	-5.8	-6.2	-6.3	-6.6	-6.2	-6.4
12/23 12:00	-6.9	-6.7	-5.6	-5.4	-5.8	-5	-6.2	-4.9	-5.5	-5.6	-5.4	-5.5	-5.7
12/23 13:00	-5.6	-6.4	-5.4	-5.1	-5.6	-4.9	-5.9	-4.7	-5.2	-5.3	-4.9	-5	-5.3
<b>Possible Icewine Opportunity #8: Dec 31</b>													
12/31 8:00	-6.8	-7.6	-7.1	-6.4	-7	-6.1	-6.8	-6.3	-6.5	-6.3	-5.9	-6.2	-6.3
12/31 9:00	-7.4	-8.4	-7.8	-7.2	-7.7	-7	-7.8	-7	-6.8	-7	-6.8	-6.8	-7
12/31 10:00	-7.6	-8.7	-8	-8	-8.2	-7.7	-8.4	-7.9	-7.3	-7.5	-7.3	-7.2	-7.4
12/31 11:00	-7.7	-8.6	-7.8	-8.2	-8.2	-7.9	-8.6	-8.1	-8	-8	-7.7	-7.6	-7.9
12/31 12:00	-7.9	-8.7	-7.6	-8.4	-8.4	-8.3	-9	-8.6	-8.4	-8.3	-8	-7.9	-8.1
12/31 13:00	-7.5	-8.4	-6.9	-8	-7.8	-8	-8.9	-8.4	-8.2	-8.3	-8.1	-8.2	-8.5
12/31 14:00	-7.2	-7.9	-6.8	-7.3	-7.4	-7.5	-8.2	-7.6	-8	-8	-7.8	-8.1	-8.4
12/31 15:00	-6.8	-7.5	-6.6	-6.7	-7	-6.7	-7.5	-6.9	-7.1	-7.4	-7.2	-7.5	-7.6
12/31 16:00	-6.7	-7.6	-6.5	-6.5	-7.1	-6.6	-7.4	-7.2	-6.4	-6.6	-6.1	-6.8	-6.9
12/31 17:00	-7.2	-8.3	-7.2	-6.8	-7.4	-6.9	-7.6	-7.2	-6.8	-7	-6.3	-7	-7.3
12/31 18:00	-7.8	-8.9	-7.8	-7.4	-8	-7.5	-8.2	-7.5	-6.9	-7.3	-6.8	-7.4	-7.6
12/31 19:00	-8.4	-9.5	-8.5	-8.1	-8.7	-8.1	-8.7	-8	-7.7	-7.9	-7.5	-7.9	-8.2
12/31 20:00	-9	-10	-9	-8.7	-9.3	-8.7	-9.4	-8.7	-8.3	-8.1	-7.7	-8	-8.3
12/31 21:00	-9.3	-10.4	-9.4	-9.1	-9.7	-9.1	-9.8	-9	-8.7	-8.6	-8.3	-8.5	-8.7
12/31 22:00	-9.5	-10.7	-9.7	-9.4	-10	-9.4	-10	-9.4	-9.5	-9.8	-9.6	-9.8	-9.9
12/31 23:00	-10.4	-11.6	-10.8	-10.3	-10.9	-10.1	-10.8	-10.1	-11.1	-11.2	-10.7	-11.1	-11.6

Legend:  Ice Wine Temperatures  
 Below Ice Wine Temperatures

Figure 9: Hourly Temperatures



## SUMMARY

December 2008 had a greater number of colder temperature events as compared to the past two Decembers. Average temperatures for the month were below  $-0.8^{\circ}\text{C}$ , the 30-year normal for Vineland. Of the 13 NAWN stations, the coldest December temperature reached was  $-16.0^{\circ}\text{C}$  at the Grimsby station, compared to  $-11.8^{\circ}\text{C}$  last year at the Vineland Cherry Ave station. Consequently, December 2008 provided more opportunities for harvesting than in the previous two years. Locations with a slightly higher elevation often accumulated more ice wine hours due to minimum temperatures remaining close to  $-8^{\circ}\text{C}$ , while temperatures at lower elevation locations remained slightly above  $-8^{\circ}\text{C}$ . Furthermore, locations closer to the lake experienced warmer temperatures, resulting in even fewer ice wine hours. The importance of adequate, accurate and timely temperature monitoring is apparent, as temperatures vary significantly between locations. In addition, monitoring is essential due to the limited period of time in which temperatures are between ice wine thresholds, which emerge and change rapidly. Wind also plays a significant role, as temperatures can plunge suddenly; and rapidly in areas where winds become calm. This occurrence can be widespread or extremely isolated.

