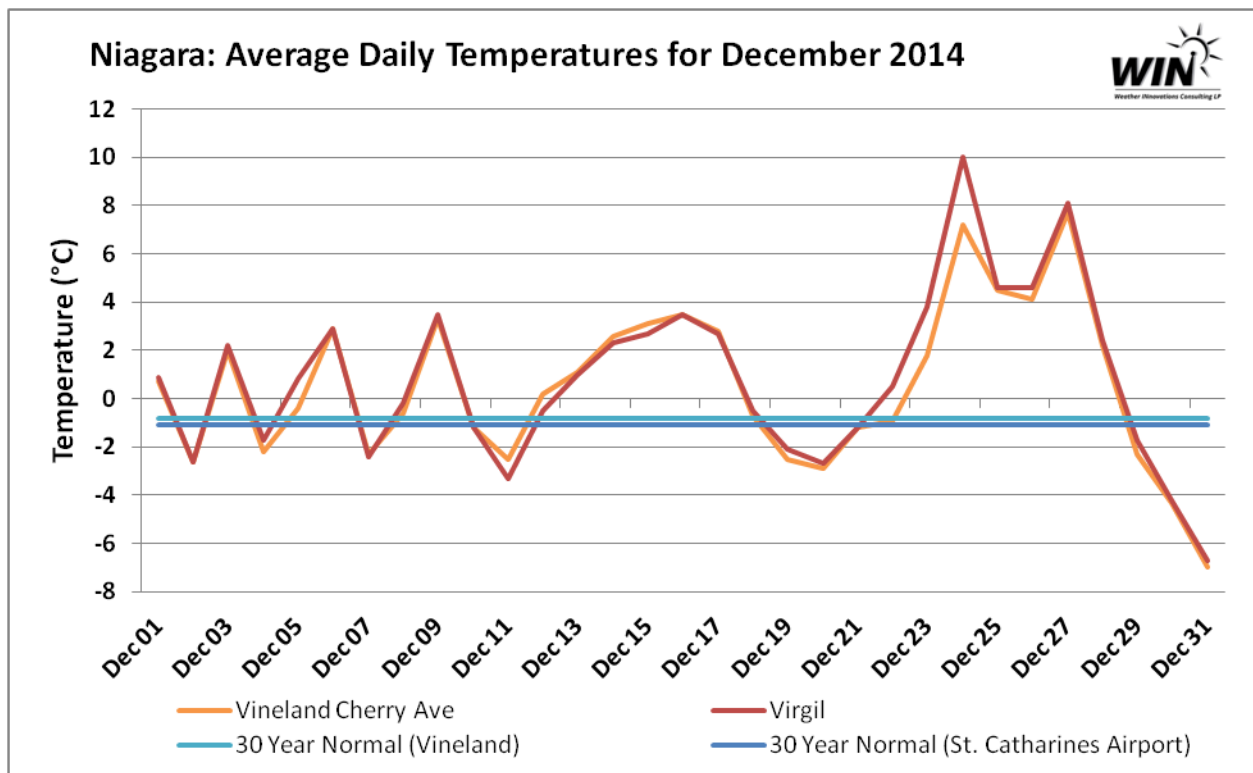




December 2014

Overview

Temperatures were near normal in December, in contrast to the below normal temperatures of December 2013. Monthly temperatures averaged 0.3 °C in the west and 0.7 °C in the east. Accordingly, the average monthly temperature in the west was 1.1 °C above normal (compared to 2.1 °C below normal in 2013) and 1.8 °C above normal in the east (compared to 1.4 °C below normal in 2013). These statistics are based on Environment Canada’s 30-year normals. This summary illustrates December 2014 temperatures and icewine harvest opportunities that arose. For this report, icewine hours are defined as instances when the average hourly temperature was between -8.0 °C and -12.0 °C, inclusive.



Temperature Analysis

Colder-than-normal temperatures arrived in mid November for a four day period from Nov 18-21, with the coldest temperature reaching -13.2 °C at St. Catharines Fifth St. in the east and -13.1 °C at Rockway in the west. The monthly minimum temperatures for each site in December 2014 ranged from -9.4 °C at Niagara Airport, Lakeshore, and Parkway to -11 °C at Grimsby. The monthly minimum temperatures occurred on December 31. There were six days in November and three days in December when temperatures at one or more stations dipped into icewine temperature ranges.



Niagara East: November 2014 Daily Minimums

Date	St. Catharines Glass Ave	St. Catharines Third Ave	West St. Catharines Fifth St	Niagara Catharines	St. David's College	Niagara Airport	Virgil	NOTL Irvine Road	Lakeshore	Parkway	Queenston		
1-Nov	2.1	2	1.7	2.1	2	2	2.1	2.3	2.4	2.1	2.3	2.5	2.4
2-Nov	1.1	0.9	0.3	0.5	-0.1	-0.3	0	0.5	0.3	0.5	0.9	0.7	0.2
3-Nov	1.5	0.3	0.2	0.3	1.8	2.1	1.4	1.8	1.9	2.2	1.8	2.1	2.5
4-Nov	11.7	11.4	10.8	11.4	11.4	11.3	11.4	11.8	11.5	11.6	11.6	11.6	11.3
5-Nov	0.8	1.1	0.8	1.7	1.1	0.6	1.1	1	0.3	1.1	0.8	0.4	1.1
6-Nov	1.3	0.7	1.6	2.9	5	2.8	1.1	2.1	0.8	0.8	2.4	0.6	3.4
7-Nov	-2.3	-2.5	-3.8	-1.5	-1.4	-1.9	-0.8	-1.3	-1.8	-1	-0.6	-0.5	-1.9
8-Nov	-3.1	-3.4	-4.4	-2.4	-2.6	-2.4	-1.9	-2.9	-4.5	-2.3	-2.6	-1.7	-3.2
9-Nov	0.8	0.5	-0.8	0.4	0.7	0.8	1.4	1.2	1	1.8	1.9	1.2	0.7
10-Nov	0.7	0.8	2.4	4.2	3.5	3.1	2.2	3.9	3.4	2.8	2.7	2.6	3.7
11-Nov	0.7	1	2.8	4.9	8.9	6.3	0.9	5.3	2.6	2.4	5.3	3.2	10.9
12-Nov	1.1	0.9	0.4	0.9	0.9	0.6	0.8	0.9	1	0.9	1	1	0.9
13-Nov	-2.7	-4.3	-4	-3.8	-2.8	-2.9	-3.5	-3.2	-3.5	-3	-2.7	-3	-2.7
14-Nov	-3.3	-5.4	-5.2	-4.9	-3.7	-3.9	-4.4	-4	-4.3	-3.9	-3.4	-3.9	-3.6
15-Nov	-5.6	-6.1	-5.7	-4.3	-3.7	-3.8	-5.6	-3.8	-4.4	-4.1	-4.3	-3.4	-3.7
16-Nov	-2	-2.3	-2.6	-2.2	-2.2	-2.4	-2.3	-2.1	-2.2	-2.2	-2.2	-2.2	-2
17-Nov	-4.6	-4.9	-5.3	-4.9	-4.8	-5.1	-4.9	-4.6	-4.7	-4.6	-4.3	-4.3	-4.6
18-Nov	-8.6	-8.9	-9.4	-8.8	-8.6	-8.8	-8.6	-8.4	-8.4	-8.4	-7.9	-8.2	-8.5
19-Nov	-10.1	-10.8	-10.9	-10.5	-9.6	-9.8	-10.3	-10.2	-10.1	-10.1	-10.5	-10	-9.8
20-Nov	-7.5	-8.4	-9.3	-8.5	-8.2	-8.4	-7.9	-8	-8	-7.3	-7.1	-7.2	-8
21-Nov	-12	-12.5	-13.2	-10.1	-9.4	-9.5	-9.4	-10.8	-11.1	-8.3	-8	-11.1	-10.4
22-Nov	-7.4	-7.7	-8.4	-7.6	-6	-6.1	-7	-6.2	-6.5	-6.1	-6.4	-6	-5.1
23-Nov	7	6.6	6.4	6.7	7.2	7	7.3	7.5	7.3	7.1	7.4	7.6	7.3
24-Nov	5.8	5.4	4.8	5.1	5.3	5.3	5.2	5.4	5.7	5.5	5.6	5.9	5.7
25-Nov	1.2	0.9	0.7	1	1	0.9	1	1.1	1.2	1.1	1.2	1.3	1.2
26-Nov	-1.6	-1.9	-2.8	-0.8	-1.1	-1.3	-1.9	-1.8	-3.6	-1.3	-2.2	-3.1	-2.8
27-Nov	-2.3	-2.7	-3.4	-3.2	-2.9	-3	-2.5	-2.1	-2	-1.9	-2.1	-2.1	-2.4
28-Nov	-9.3	-9.5	-10.7	-8.4	-8	-9.5	-7.4	-7.8	-7.6	-6.3	-6.2	-7.8	-9.5
29-Nov	-5.2	-5.7	-5.9	-5.9	-4.9	-4.8	-4.7	-4.3	-4.2	-4.7	-4.4	-4.3	-4.2
30-Nov	5.8	5.6	5.5	5.8	5.8	5.6	5.7	6	5.9	5.6	5.6	5.9	6.2



Legend:

	Days with Ice Wine Temperatures
	Monthly Minimum



Niagara West: November 2014 Daily Mimimums

Date	Winona	Grimsby	West Lincoln	Lincoln Fly Road	Beamsville	Lincoln Hwy 8	Vineland Lakeshore	Vineland Cherry Ave.	Jordan Escarpment	Jordan Escarpment	Jordan Hwy 8	Jordan Harbour	Rockway
1-Nov	1	0.6	0.5	0.7	1.5	1.4	2.2	1.8	1.4	1.5	1.8	1.9	1.5
2-Nov	-0.6	-1.3	-0.9	-0.9	-0.1	-0.1	0.8	0.3	-0.3	0	0.5	0.3	0.3
3-Nov	0.8	0.5	-0.4	0.5	1.5	0.7	1.2	1.4	1.5	1	1.7	1.3	1.1
4-Nov	10.7	10.5	10.6	10.5	11.2	11.2	11.7	11.8	11.3	11.1	11.8	11.4	11.2
5-Nov	0.5	-1.3	1	2.4	3	1.8	1	0.4	2.3	1.1	1.5	0.7	0.6
6-Nov	0.8	-1.2	1.4	3.1	3.6	2.2	1.1	1.7	2.8	2.1	1.5	1.6	0.8
7-Nov	-3.5	-5.1	-2.9	-2.1	-2.1	-2.1	-1.6	-3	-1.7	-2.3	-1.9	-2.1	-2.4
8-Nov	-4	-5.5	-3.6	-2.4	-2.3	-2.6	-2	-4	-2.1	-2.8	-2.2	-2.5	-2.6
9-Nov	-0.4	-1.3	-0.8	-0.9	0.3	0.1	0.4	0.4	0.1	0	0.7	0.3	0.2
10-Nov	1.3	-0.5	2.8	3.7	2.6	2.5	0.2	1.9	3.6	3.4	2.8	-0.1	1.1
11-Nov	1.8	-0.6	5.1	8.2	3.8	3.2	0.1	-0.3	6.4	7	3.2	-0.5	1.5
12-Nov	0.8	-0.4	-0.1	-0.1	0.5	0.4	1.1	0.8	0.4	0.4	1.1	0.6	0.6
13-Nov	-2.7	-4.3	-4.5	-4.2	-3.4	-3.3	-2.8	-2.9	-3.3	-3.9	-3	-3.1	-3.7
14-Nov	-3.1	-5.1	-5.2	-4.4	-3.7	-3.4	-3	-3.6	-3.8	-4.4	-3.4	-3.5	-4.3
15-Nov	-3.5	-7.1	-5	-4.6	-3.3	-3.5	-5	-3.7	-3.9	-5.2	-3.4	-5	-4.6
16-Nov	-2.2	-3.3	-3.2	-3.1	-2.5	-2.3	-2	-2.1	-2.6	-2.7	-2.1	-2.3	-2.2
17-Nov	-5.4	-6.5	-6.3	-6.3	-5.5	-5.7	-4.8	-5	-5.5	-5.5	-4.7	-5.2	-5.2
18-Nov	-9.2	-10.3	-10.1	-10.1	-9.4	-9.5	-8.7	-9	-9.4	-9.5	-8.6	-9.2	-9.1
19-Nov	-10.1	-12.6	-12.3	-11.5	-10.9	-11	-10	-9.8	-10.6	-11.1	-10.3	-10	-10.9
20-Nov	-8.3	-9.4	-9.3	-9	-8.3	-8.6	-7.5	-7.8	-8.4	-8.8	-7.5	-8	-8.4
21-Nov	-9.8	-11.6	-12.4	-11.2	-10.6	-10.9	-11	-12.5	-10.1	-10.9	-11.1	-10.8	-13.1
22-Nov	-6.3	-7.3	-8	-8	-7.1	-7.1	-7.6	-7.5	-7.2	-7.4	-8.9	-7.9	-7.4
23-Nov	4.8	5.3	5.6	5.9	5.7	5.5	6	4.9	6.4	6.3	5.7	6.3	6.5
24-Nov	5.1	4	4.3	4.4	5.1	4.9	5.6	5.4	4.9	4.9	5.7	5.3	5.1
25-Nov	1	-0.1	0	0.1	0.7	0.6	1.3	1.1	0.6	0.4	1.1	0.9	0.6
26-Nov	-0.8	-2.8	-2.5	-2.5	-2	-2.2	-2.4	-2.5	-1.6	-2	-1.6	-1.8	-2.1
27-Nov	-3.4	-4.6	-4.4	-3.8	-3.2	-3.3	-2.1	-2.4	-3.1	-2.9	-2.5	-2.9	-2.7
28-Nov	-7.4	-11.9	-10	-9.2	-7.9	-7.8	-6.3	-9	-7.7	-9.2	-7.9	-7.8	-10.9
29-Nov	-4.7	-6.2	-5.9	-6.2	-5.3	-5.2	-4.6	-4.8	-5.3	-5.8	-5	-5.4	-5.9
30-Nov	6	4.9	5	4.8	5.6	5.4	5.6	5.8	5.3	5.5	6	5.3	5.4



Legend:

	Days with Ice Wine Temperatures
	Monthly Minimum



Niagara East: December 2014 Daily Minimums

Date	St. Catharines Glass Ave	St. Catharines Third Ave	West St. Catharines Fifth St	Niagara Catharines	St. David's College	Niagara Airport	Virgil	NOTL Irvine Road	Lakeshore	Parkway	Queenston		
1-Dec	-4	-4.2	-4.5	-4.2	-4.6	-4.8	-4.4	-4	-4.1	-4.3	-4	-3.9	-4
2-Dec	-6.3	-6.7	-7.2	-6.6	-7.1	-8	-7.2	-6.8	-6.8	-6.7	-6.5	-6.5	-7.7
3-Dec	0	-0.4	-0.9	-0.2	-0.2	-0.4	-0.3	-0.2	0	0	0.3	0.2	-0.1
4-Dec	-4	-5	-5.8	-4.5	-4.2	-5.3	-4.6	-3.3	-4	-4.2	-4	-3.6	-3.9
5-Dec	-5	-4.2	-6.4	-4.5	-3.6	-3.8	-4.7	-3.7	-4.3	-4.2	-4.2	-4	-4
6-Dec	0.7	0.3	0	0.2	-0.2	-0.5	-0.2	0.1	0.1	0.2	0.5	0.4	-0.2
7-Dec	-4.3	-4.6	-4.9	-4.2	-4.6	-4.9	-4.7	-4.4	-4.4	-4.6	-4.6	-4.4	-4.7
8-Dec	-4.8	-5.1	-6.4	-5.5	-6	-6	-5.5	-5.2	-5.2	-5.3	-5	-4.9	-5.6
9-Dec	2.3	2.1	1.8	2	1.9	1.6	1.8	2.1	2.1	2	2.2	2.3	2
10-Dec	-2.5	-3	-3.2	-3	-3.5	-3.9	-3.6	-3.4	-3.5	-3.5	-3.2	-3.5	-4
11-Dec	-3.7	-4.1	-4.2	-3.9	-4.5	-4.7	-4.4	-4.3	-4.6	-4.4	-4.2	-4.4	-4.6
12-Dec	-3.1	-4	-3.2	-2.4	-2.5	-2.9	-4.9	-5.9	-8.1	-3	-2.8	-6.3	-3.2
13-Dec	0.1	-0.2	-0.3	-0.1	-0.1	-0.1	-0.1	0.1	0.2	0	0.2	0.2	0.1
14-Dec	2	1.3	0.9	1.4	1.7	1.7	1.5	1.7	1.7	1.6	1.6	1.9	1.9
15-Dec	1.5	0.7	0.6	1.1	1.3	1.3	1.1	0.9	1.1	1.4	1.4	1.4	1.1
16-Dec	1	0.8	0.5	0.7	0.5	0.3	0.5	0.7	0.5	0.6	0.7	0.7	0.6
17-Dec	-0.9	-1.3	-1.7	-1.2	-1.2	-1.5	-1.1	-0.9	-1	-1	-0.7	-0.8	-1.3
18-Dec	-2.4	-2.7	-2.9	-2.5	-2.5	-2.7	-2.6	-2.1	-2.2	-2.3	-2.1	-2.1	-2.2
19-Dec	-3	-3.2	-3.8	-3.2	-3.4	-3.7	-3.4	-3.3	-3.5	-3.4	-3.4	-3.5	-3.5
20-Dec	-5.6	-6.6	-7.2	-6.2	-5.1	-5.9	-5	-4.7	-5.4	-5.3	-4.7	-4.9	-5.4
21-Dec	-3.5	-4	-4.1	-3.5	-3.5	-3.4	-3.6	-3.7	-4.2	-3.5	-3.5	-4.1	-4.5
22-Dec	-2.4	-2.7	-4.6	-2.7	-2.1	-3	-2.6	-2.1	-2.3	-3	-2.5	-2.1	-2.5
23-Dec	-2.1	-1.1	-3.1	-2.3	-0.9	-2.1	-1.3	-0.8	-0.7	-1.4	-0.1	-0.4	-1.5
24-Dec	4.2	4.1	4.4	4.4	5.8	5.4	4.6	4.9	5.5	4.3	4.2	5.5	6.4
25-Dec	3.7	3.4	3.2	3.4	3.5	3.3	3.3	3.4	3.7	3.5	3.6	3.7	3.6
26-Dec	2.1	1.1	1.9	1.7	2.1	0	1	1.1	-0.4	1.1	1.7	1.7	0.5
27-Dec	0	0.4	0.1	1.2	2.6	2.1	0.1	0.3	-1.1	0.4	0.5	0.5	1.9
28-Dec	-1.6	-3.7	-2.7	-2.5	-2.3	-1.7	-1.7	-1.6	-2.4	-1.9	-2.1	-1.5	-1.6
29-Dec	-4.2	-4.8	-5.4	-4.2	-4.7	-4.3	-2.9	-3.1	-3.2	-2.9	-2.7	-3.2	-4.2
30-Dec	-6.1	-6.6	-6.8	-6.3	-6.6	-6.9	-6.2	-6.5	-6.6	-6.4	-6.3	-6.3	-6.9
31-Dec	-9.5	-10.1	-10.2	-9.8	-9.7	-9.8	-9.4	-9.7	-9.7	-9.7	-9.4	-9.4	-9.5



Legend:

	Days with Ice Wine Temperatures
	Monthly Minimum



Niagara West: December 2014 Daily Minimums

Date	Winona	Grimsbby	West Lincoln	Lincoln Fly Road	Beamsville	Lincoln Hwy 8	Vineland Lakeshore	Vineland Cherry Ave.	Jordan Escarpment	Jordan Escarpment	Jordan Hwy 8	Jordan Harbour	Rockway
1-Dec	-5.1	-6.2	-5.7	-5.5	-4.7	-4.8	-4	-4.3	-4.9	-4.7	-4	-4.4	-4.7
2-Dec	-5.6	-7.1	-7.3	-7.2	-6.5	-6.6	-5.5	-6.2	-7.1	-7.1	-6.8	-6.6	-7.3
3-Dec	-0.4	-1.8	-1.4	-1.4	-0.7	-1	-0.1	-0.4	-0.8	-0.8	0	-0.6	-0.6
4-Dec	-5	-7.2	-5.3	-4.8	-4.4	-4.6	-4.3	-5.3	-4.4	-4.4	-5.7	-4.6	-6.7
5-Dec	-6	-6.5	-4.7	-4.6	-3.8	-4.9	-5.2	-5.5	-3.7	-4.1	-5.3	-5.8	-6.3
6-Dec	0.6	-0.7	-0.5	-0.5	0	0.1	0.9	0.5	-0.4	-0.2	0.5	0.3	0
7-Dec	-4.1	-5.6	-5.5	-5.5	-4.9	-5.1	-4.2	-4.6	-5	-5.1	-4.7	-5	-5.1
8-Dec	-5	-5.6	-5.8	-5.8	-5.5	-5.9	-4.8	-5.4	-5.6	-6.1	-5.5	-5.3	-6.2
9-Dec	2.1	1.1	1.2	1.1	1.9	1.7	2.2	2.1	1.6	1.6	1.8	1.8	1.7
10-Dec	-2.4	-3.6	-3.4	-3.6	-2.9	-2.9	-2.3	-2.7	-3	-3.1	-2.5	-2.7	-3.1
11-Dec	-3.8	-4.8	-4.6	-4.8	-4.1	-4.2	-3.6	-3.9	-4.3	-4.4	-3.7	-3.9	-4.2
12-Dec	-3.4	-3	-4.4	-3.9	-3.3	-3.3	-1.6	-3.7	-3.1	-3.4	-2.4	-2.2	-3
13-Dec	0.4	-0.8	-0.8	-0.8	-0.1	0	0.5	0.3	0	-0.5	0.1	-0.1	-0.4
14-Dec	2.1	0.9	0.8	1.2	1.6	1.4	2.1	1.5	1.6	1.1	1.5	1.6	0.9
15-Dec	2.2	0.6	0.6	0.7	1.4	1.4	2.2	1.7	1.3	0.9	1.3	1.5	1
16-Dec	1.4	0.3	0.4	0.2	0.9	0.8	1.2	0.9	0.5	0.4	1	0.7	0.5
17-Dec	-1.2	-2.3	-2.1	-2.2	-1.6	-1.6	-0.9	-1.1	-1.6	-2	-1.1	-1.4	-1.7
18-Dec	-2.9	-4.1	-3.8	-3.8	-3.1	-3.2	-2.5	-2.6	-3.1	-3	-2.4	-2.8	-3
19-Dec	-4.4	-6.7	-5.3	-4.8	-4.1	-4.1	-3.8	-4.3	-4	-4.1	-3.2	-3.9	-3.7
20-Dec	-6.3	-7.7	-7.4	-6.4	-5.1	-5.4	-4.2	-5.4	-5.2	-6.5	-5.9	-5	-6.7
21-Dec	-3.4	-4.9	-3.9	-3.4	-2.8	-2.9	-3	-2.8	-2.8	-3.7	-2.8	-3.5	-3.5
22-Dec	-2.7	-4	-3.1	-3.3	-2.7	-3.4	-1.8	-5.1	-2.9	-3.8	-3.6	-3.4	-4.5
23-Dec	-2	-0.6	-1.1	-1.4	-2.7	-1.8	-1.2	-3	-1.2	-2.7	-2.8	-2.4	-3.8
24-Dec	3.3	3.6	4.1	4.1	4	3.9	3.4	4.2	4.5	4.4	4.4	3.5	4
25-Dec	3.1	2.1	2.3	2.5	3.1	3.1	3.6	3.4	3.1	3.2	3.7	3.3	3.1
26-Dec	1.8	0.8	0.9	1.2	1.8	1.6	0	-0.1	1.6	1.5	1.9	1.3	1.7
27-Dec	3.6	1.3	1	1.9	3.1	2.6	0	-1.1	2.5	0.5	0.3	0	1.2
28-Dec	-1.7	-3.3	-1.9	-2.8	-1.9	-1.6	-1.8	-2	-2.2	-2.2	-1.7	-2.2	-2.3
29-Dec	-4	-7.1	-4.2	-4.8	-3.8	-3.7	-2.6	-4.3	-3.8	-5.1	-4.3	-3.8	-5.2
30-Dec	-6.1	-7.3	-6.5	-7.2	-6.5	-6.3	-6	-6.3	-6.6	-6.4	-6.1	-6.5	-6.7
31-Dec	-9.6	-11	-10.1	-10.9	-10.1	-10	-9.6	-9.7	-10.2	-10.1	-9.7	-9.9	-10.3



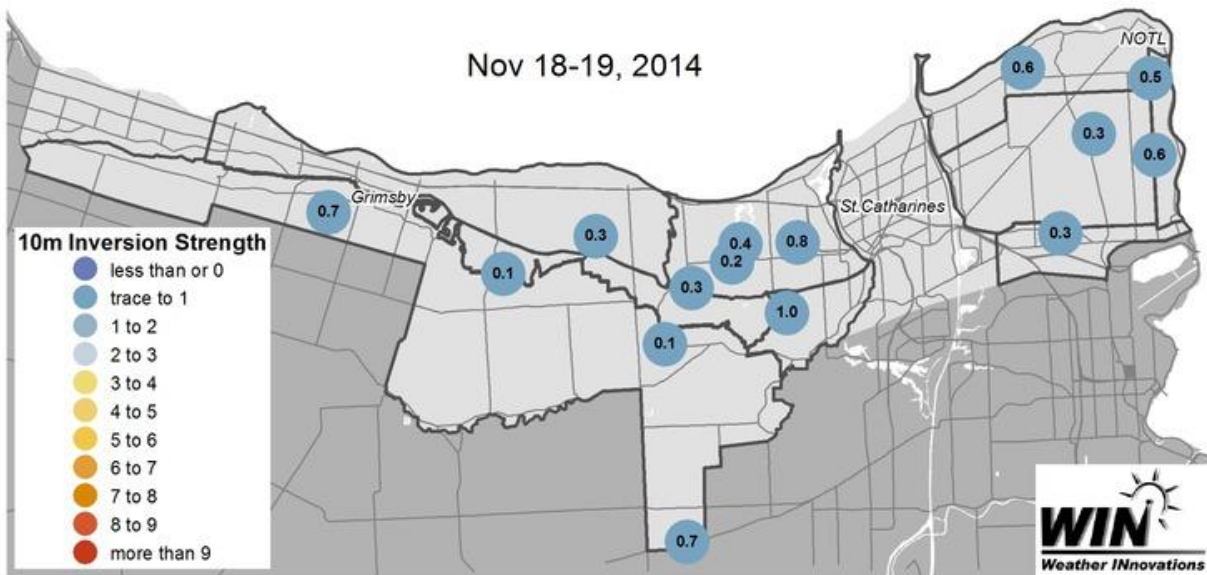
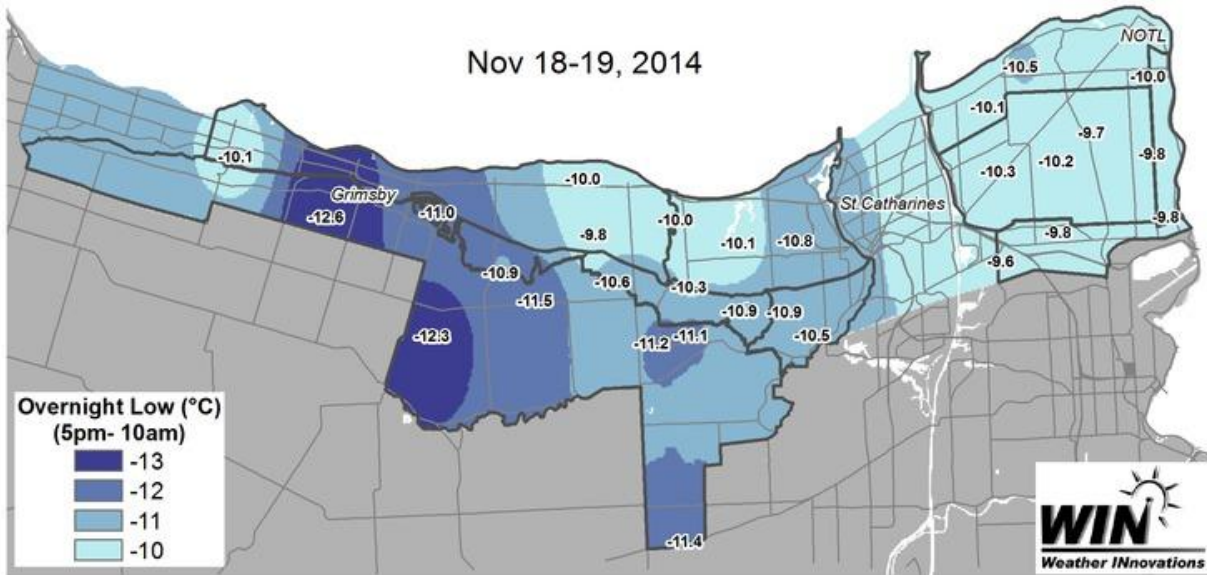
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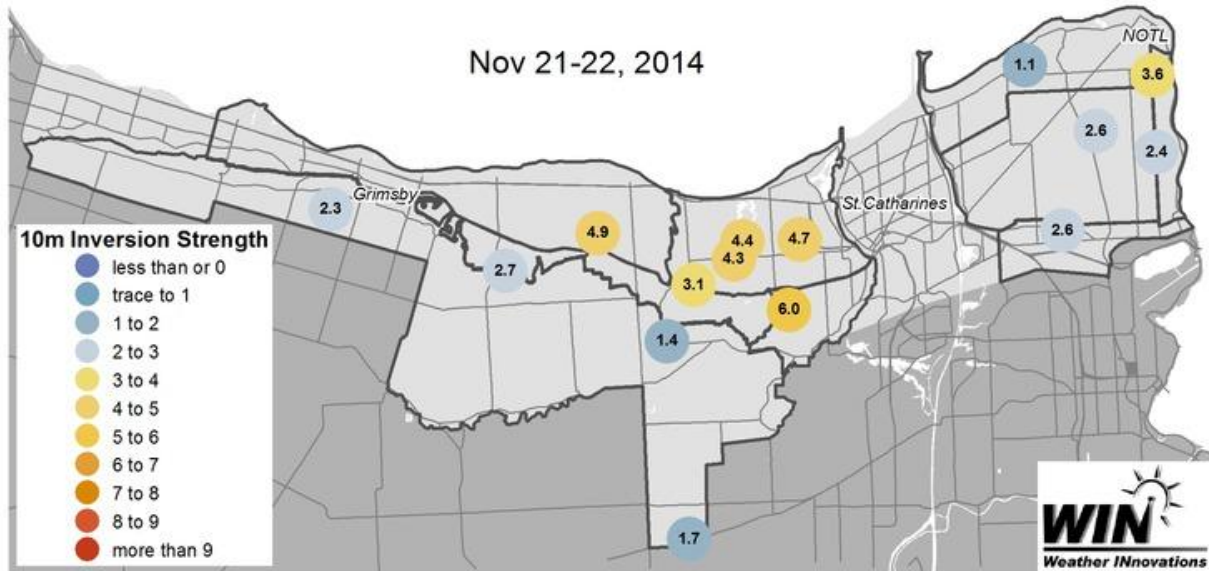
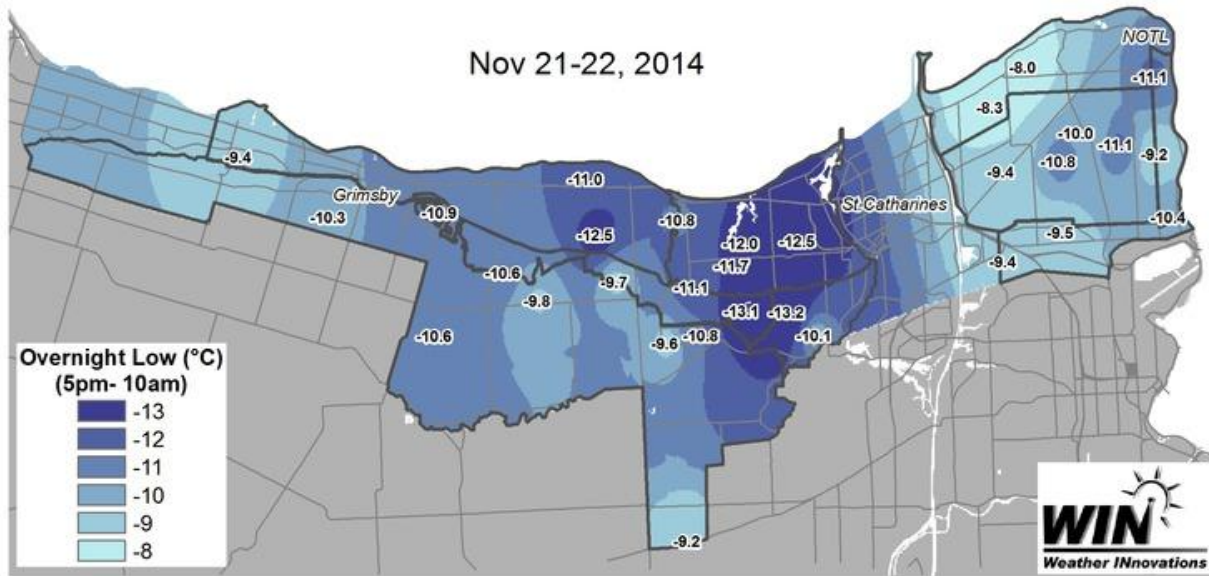
	Days with Ice Wine Temperatures
	Monthly Minimum

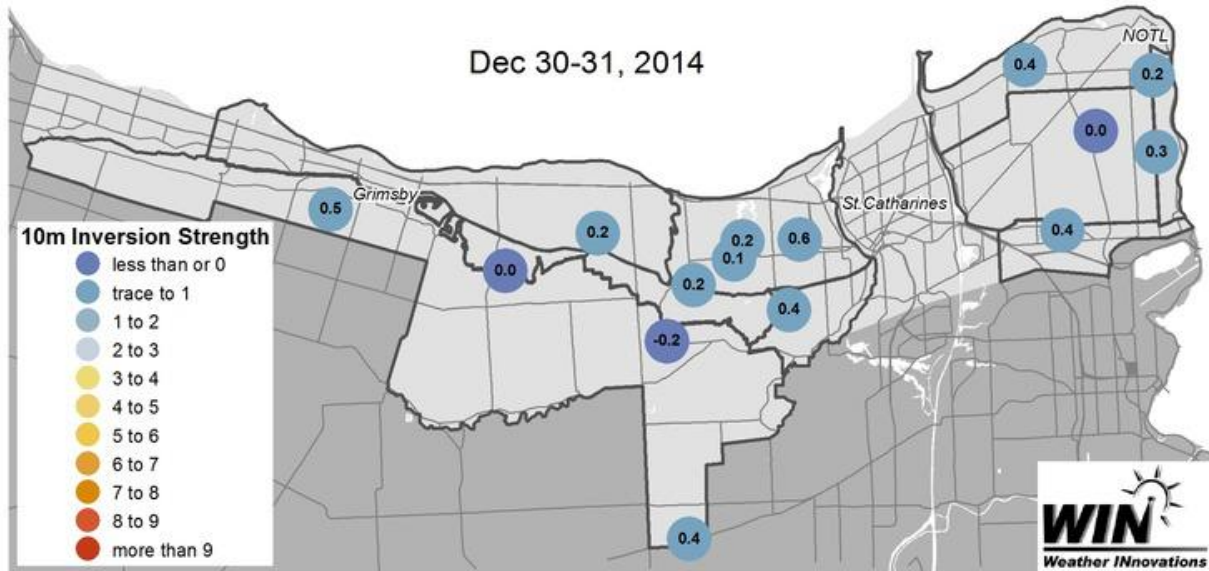
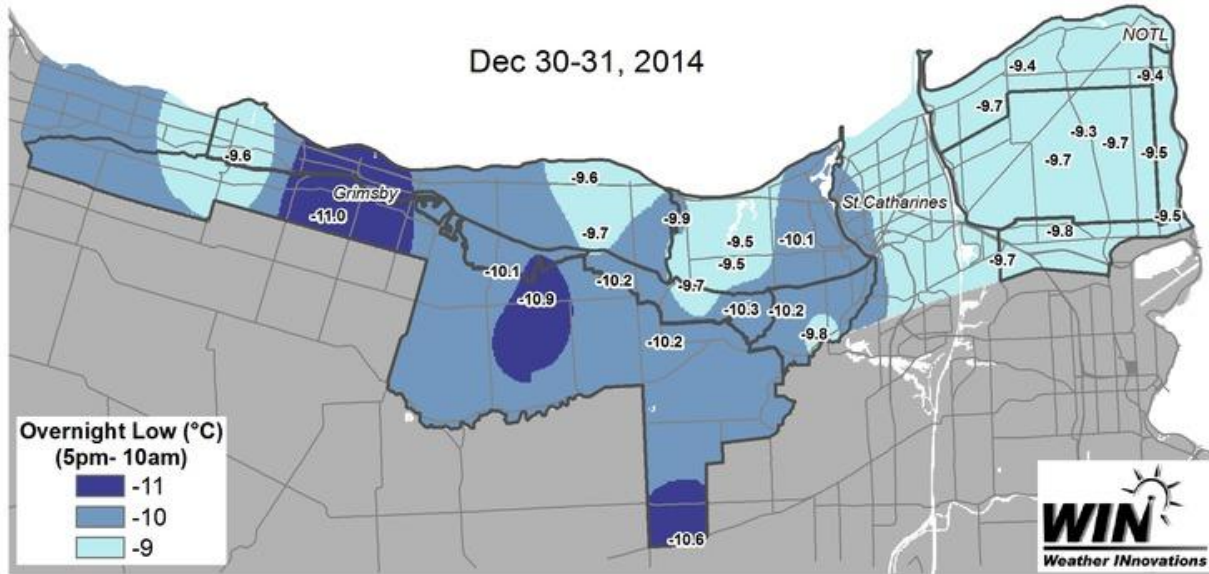


Inversion Strength

The following six figures show the coldest November and December nights: November 18-19, 21-22, and December 30-31. Note that the coldest night, November 21-22 had inversion strengths suitable for running wind machines for the coldest areas.







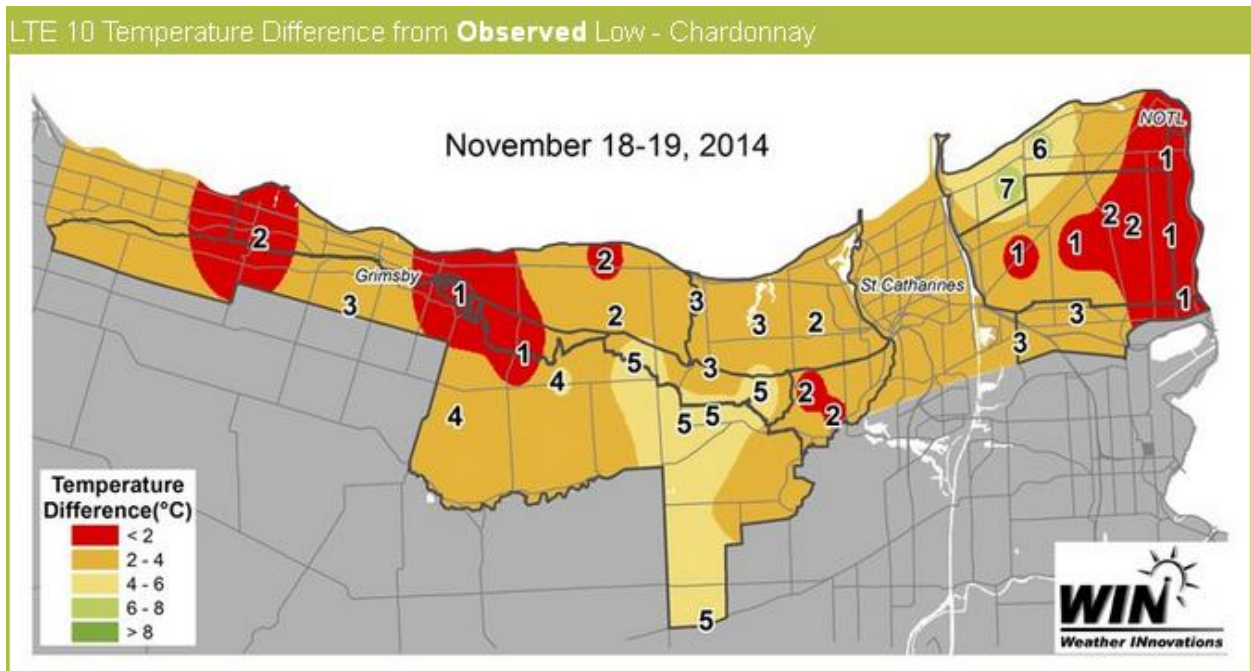
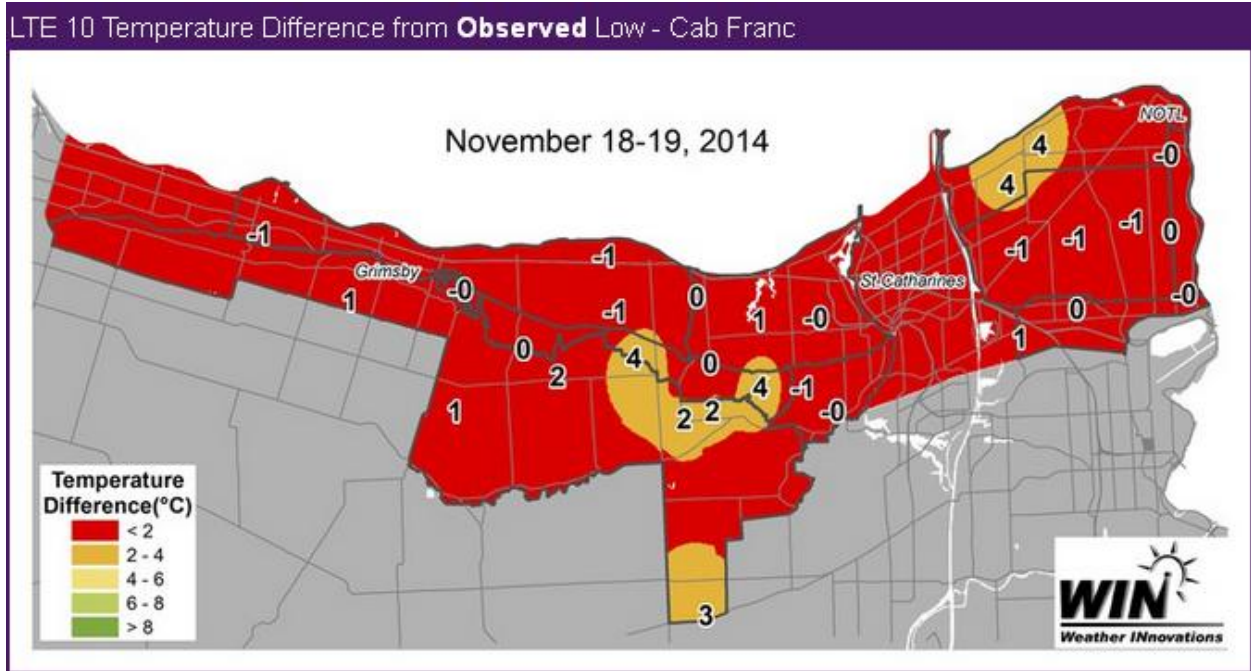
Bud Hardiness

Temperatures dropped close to the estimated LTE10 values (the temperature at which 10 % of primary buds would die) for Chardonnay and Cabernet Franc at a few locations during the coldest November nights. The following figures show the temperature difference between the observed overnight low and the approximated estimated LTE10 values at that time. Note that a negative value does not necessarily



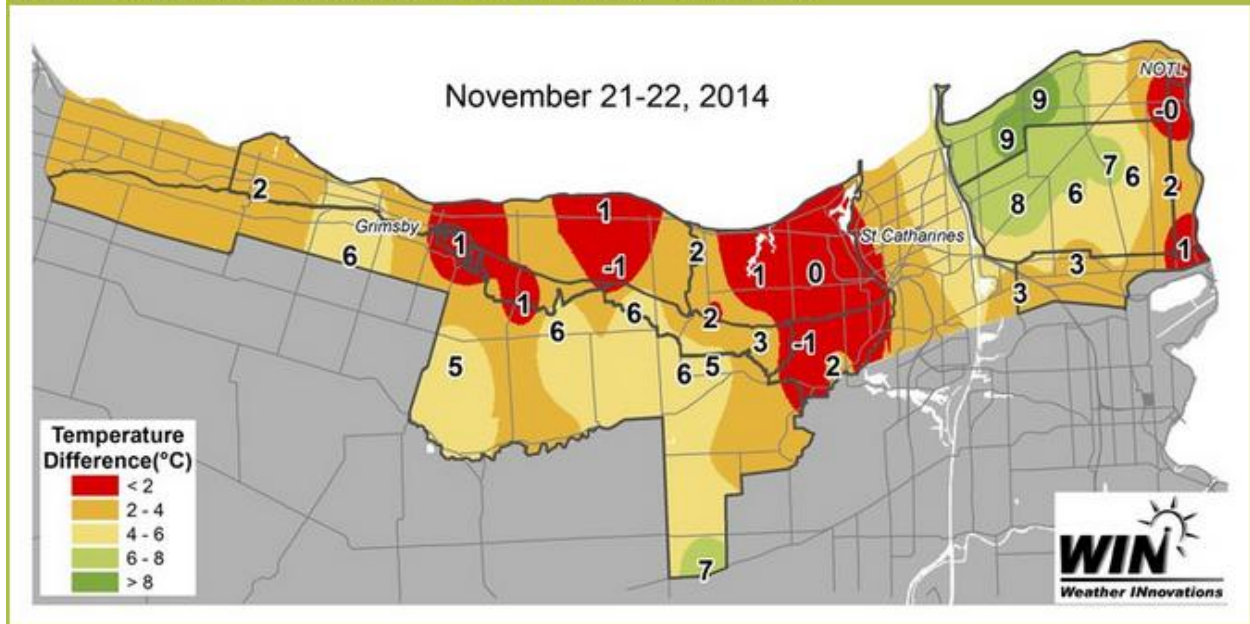
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mean that damage occurred, since LTE10 values are not updated daily and are not taken at all of the Niagara locations.

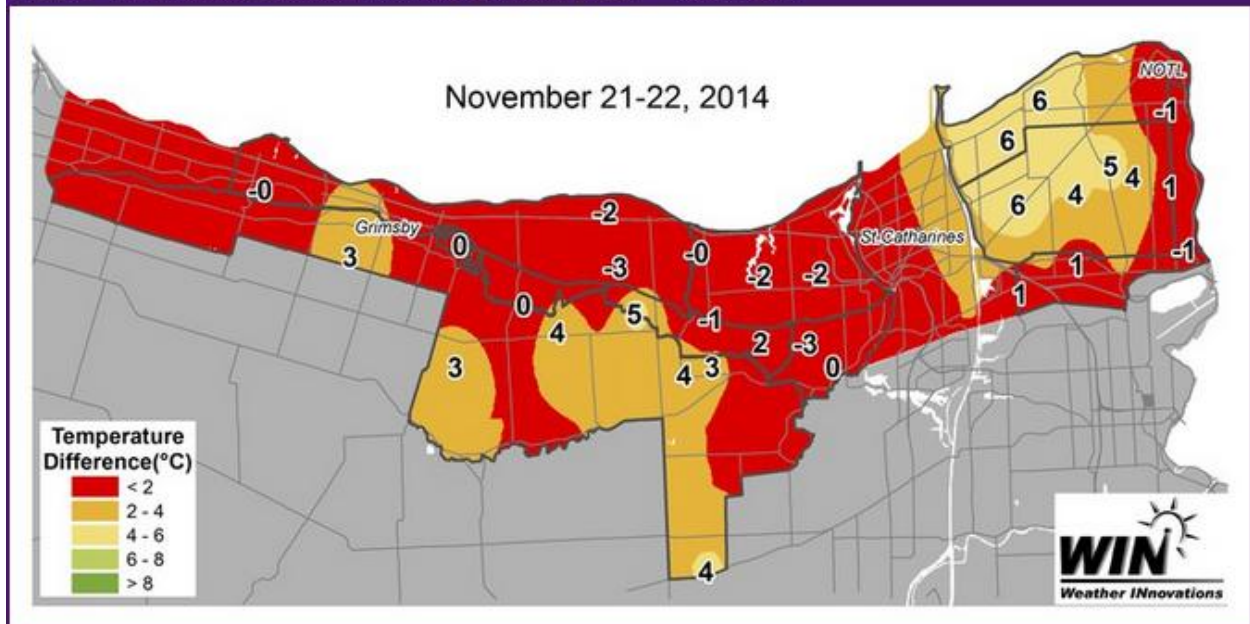




LTE 10 Temperature Difference from **Observed** Low - Chardonnay



LTE 10 Temperature Difference from **Observed** Low - Cab Franc

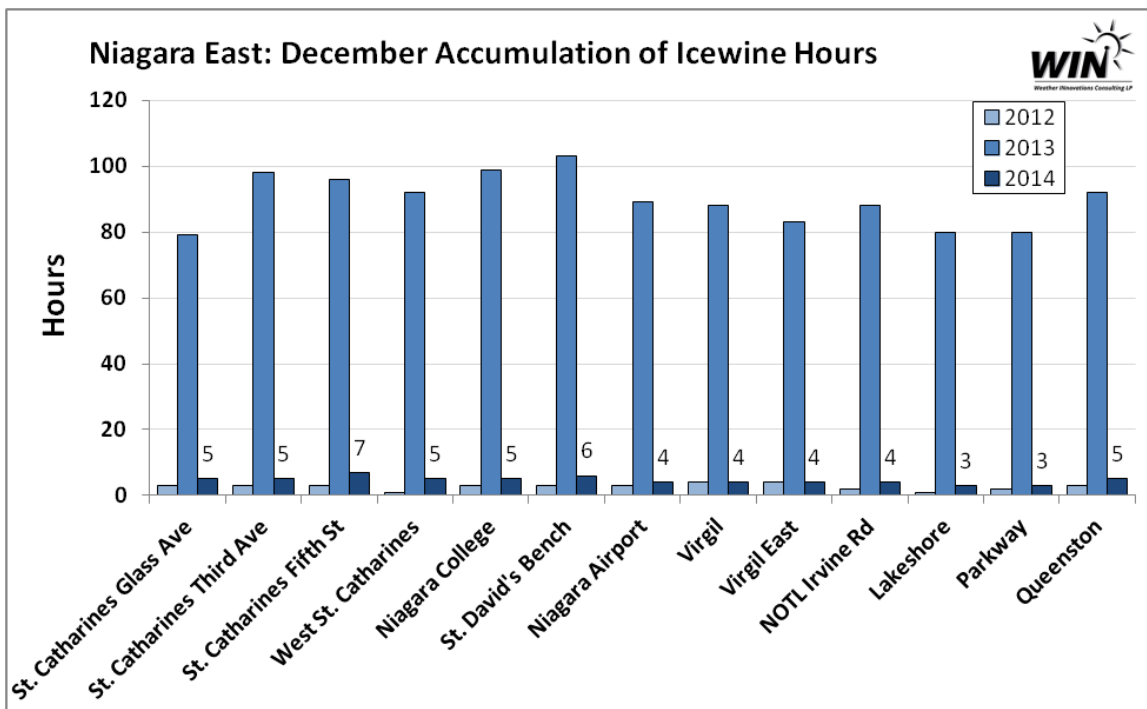
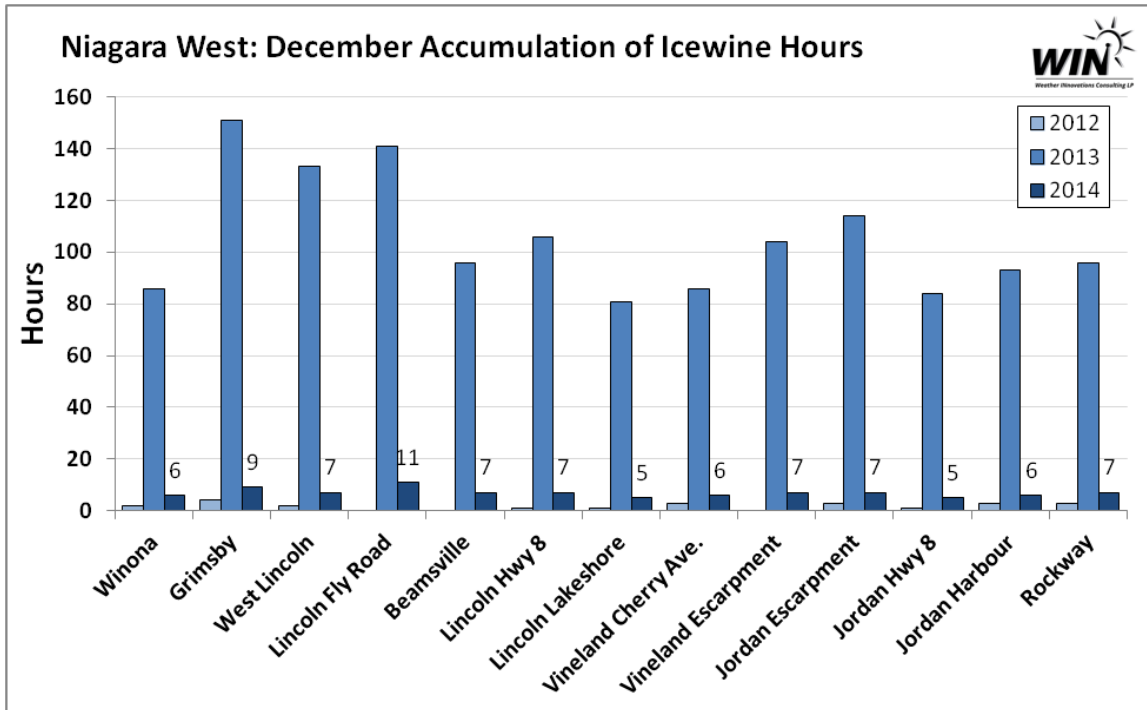


Icewine Hours Analysis

December icewine hours were significantly fewer than those in 2013. Stations recorded between 8 and 47 icewine hours over November 2014. As seen in the following two figures, all locations accumulated



icewine hours similar to those in 2012. The Niagara stations recorded between 3 and 11 icewine hours in December 2014 compared to between 79 and 151 icewine hours in December 2013. Due to the infrequent icewine harvest opportunities, many harvests were put off until the new-year.





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Summary

December 2014 temperatures were slightly above normal in the Niagara appellation; average temperatures for the month were 0.3 °C to 0.7 °C above the 30-year normals. The coldest temperature reached in Niagara was -11 °C at the Grimsby stations. November and December 2014 provided few opportunities for harvesting icewine grapes at most locations, unlike 2013. These conditions led to a later completion of the icewine harvest for many this year.