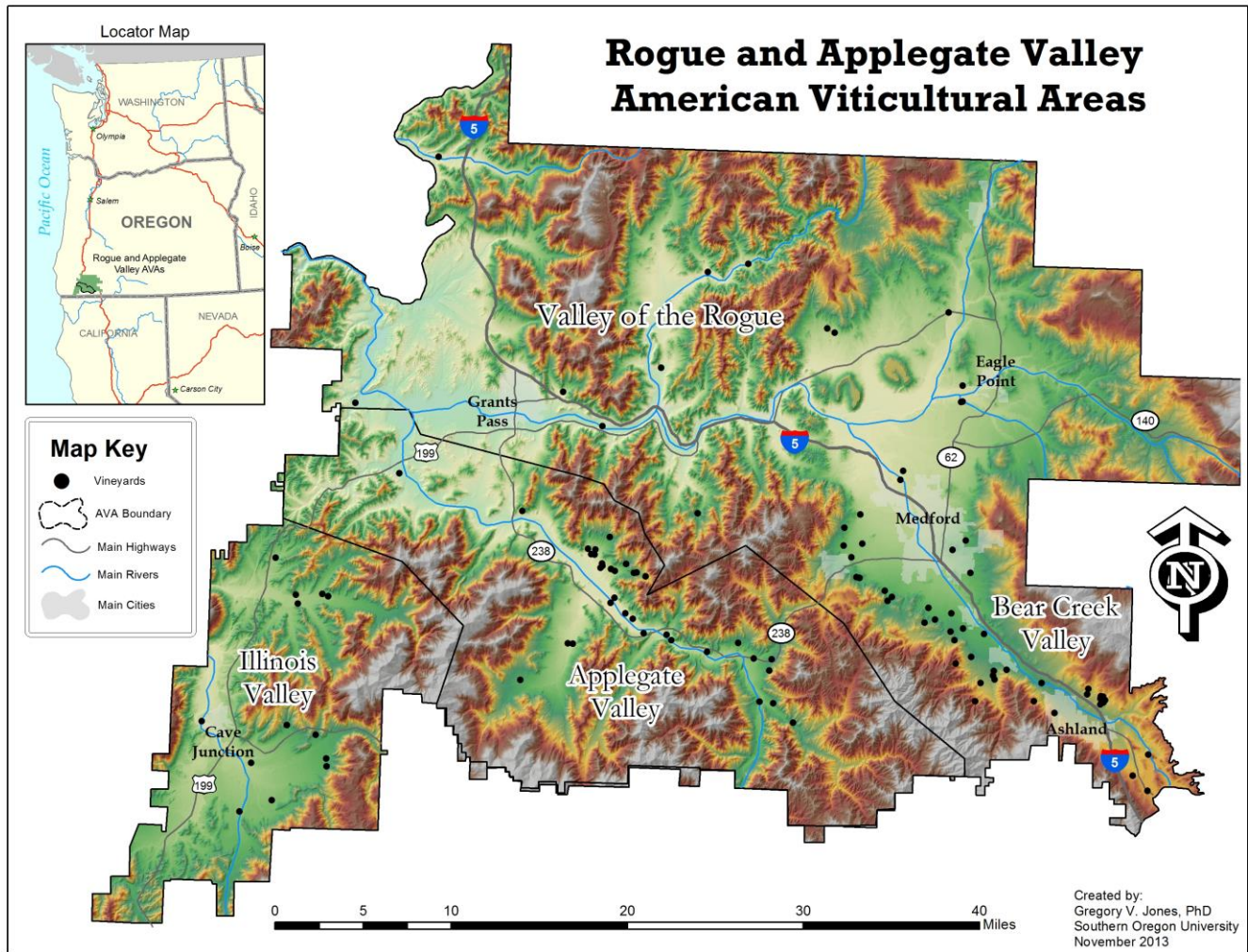


Vintage 2013

Rogue Valley Reference Vineyard Report



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Summary:

Southern Oregon and the majority of the western US experienced a generally warm and early 2013 vintage. However, the vintage will likely be most remembered for the dramatic shift to cool and wet conditions in late September, which challenged harvest decisions. While some harvested many of the early ripening varieties before the rains, those who waited to harvest did so in a record-breaking dry October, which provided a great ending to the harvest period. Growing degree-day totals were near record levels over the region, driven mostly by much higher than average minimum temperatures and slightly higher maximum temperatures throughout the growing season. The vintage had mild frost pressure into early May with a few heat spikes over 100°F during July, August and early September. The phenological timing of bud break, bloom, and véraison during 2013 was some of the earliest seen during 2003-2013, with a harvest that occurred over a 45 day period before and after the late September rains. Growers reported composition levels at harvest that showed higher than average °Brix, near average acidity and pH values, and significantly higher than average yields. Bird pressure followed the harvest windows with lower pressure with the earlier harvested varieties and sites, and higher pressure with the later harvested fruit. Other pests and disease pressure varied with leaf hoppers showing high numbers in 2013, but disease pressure being generally low to average depending on the site.

Project Overview:

This project is a continuation of the 2003-2009 reference vineyard project which established a suite of reference vineyards in the Rogue and Applegate Valley AVAs with a purpose of providing an in depth look at spatial variations in important characteristics of temperature, phenology, composition, and yields in the region. Starting with the 2010 vintage, the project has been scaled back to cover only temperature, phenology, and harvest composition from six sites (one in the Illinois Valley, two in the Applegate Valley, two in the Bear Creek Valley, and one in the Valley of the Rogue). At each of the six sites temperature devices record at 15 minute intervals during both the dormant season (Nov 1-Mar 31) and the growing season (Apr 1-Oct 31). The observations are then aggregated to hourly and daily average, maximum, and minimum values and summarized over the entire region. Additional summaries are done for the Medford NWS station at the airport and the AgriMet station at SOREC. For phenological observations, the six sites submit dates for the four main events of bud break, bloom, véraison, and harvest for a mix of varieties planted at each site. The phenological data are then summarized by average dates and intervals between dates for the entire region. Finally, harvest composition values for °Brix, titratable acidity, and pH, along with yields are submitted by the six sites and are then summarized for the region.

Climate:

The winter of 2012-13 (November 1 through March 31) was characterized by slightly colder than normal temperatures throughout the region. Temperatures at the Medford station were 0.5°F below average while those at the reference vineyards were 0.1°F below the average of the last ten years (Table 1). November and December were mostly warmer than normal, but were followed by a colder than normal January and February (Figure 1). January saw the coldest period of the winter dropping into the mid to upper teens from January 13-21 (Figure 1). March started a run of seven months with above average temperatures; 1.0-2.2°F warmer than normal throughout Southern Oregon. The region experienced an average of 82 days below 32°F during the dormant period, which was slightly more than the long term average (Table 2). While precipitation is not observed at the reference vineyards, values from the main climate stations in the region indicate that November and December were wetter than average, highlighted by a 2.22" event on November 29th and a 4.39" four day total from the 29th to December 2nd.

However, this wet period was followed by a drier than average late winter resulting in near average precipitation for November through March (5.66 inches).

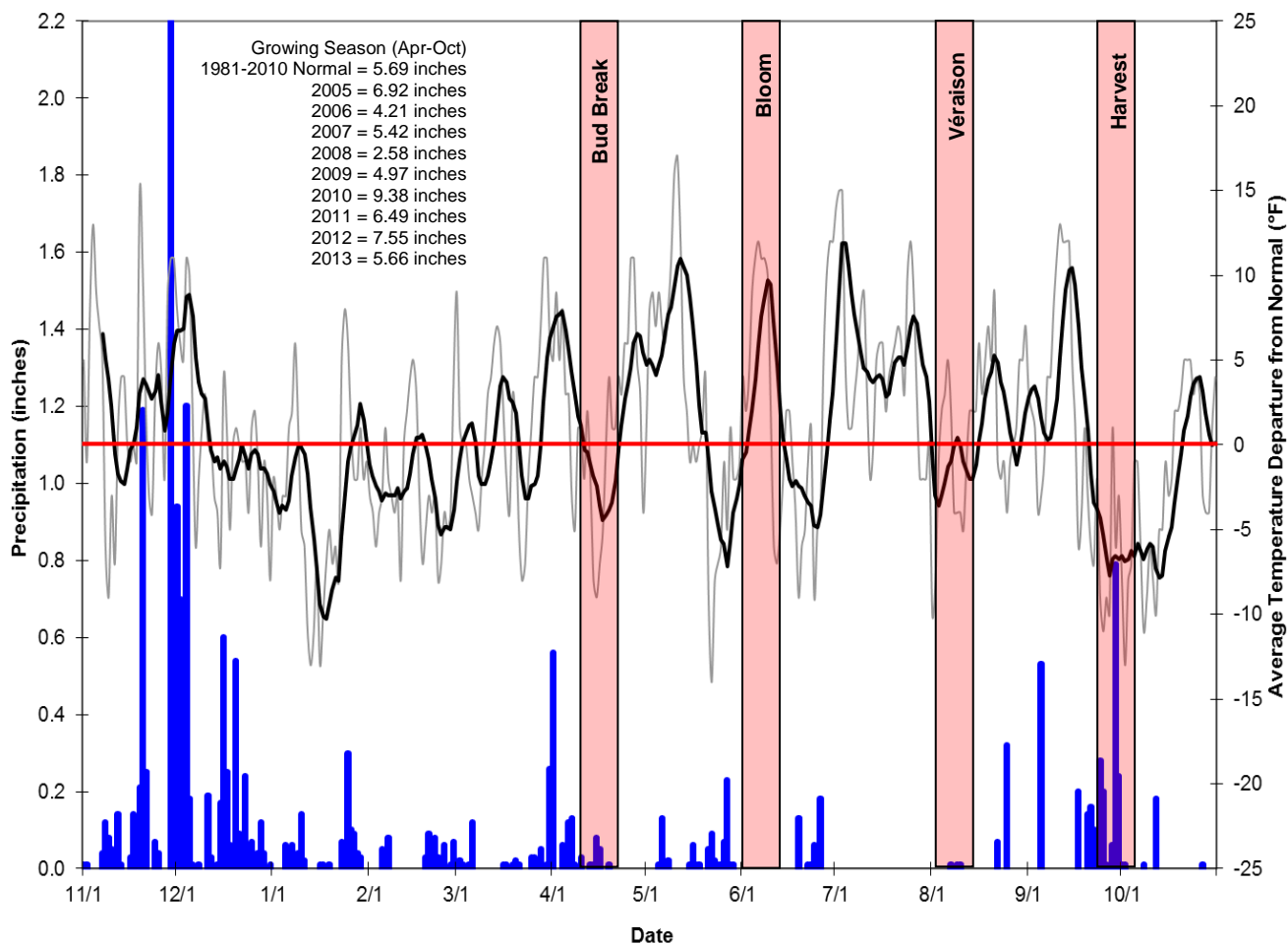


Figure 1 – Daily average temperature departures from normal and precipitation for November 1, 2012 to October 31, 2013 from the Medford Airport weather station. The gray line is the day to day temperature departures from normal, the black line is the weekly average departures, and the blue bars are daily precipitation. The long-term average is derived from the 1981-2010 climate normals. The vertical red bars represent the variation in region-wide average phenology (see text for more details).

After a cool dormant period, the growing season started out warmer and drier than normal throughout Oregon and over much of the western US. April 2013 was similar to that experienced in April 2012 and moderately warmer than 2010-2011 (Figure 1). The warm March and April resulted in bud break throughout the region during the middle of April, averaging April 15th (see more in the phenology section that follows). The warm spring continued through May and, although totals were below average for the month, May saw 17 days with a trace or more of precipitation (for Medford). Early June saw a warm up that produced a region-wide average bloom date on June 8th (Figure 1) with no rain events over the main portion of the bloom period. July brought the warmest conditions of the summer with the Southern Oregon region experiencing its second warmest July on record (+4.8°F above normal) with no precipitation. While not as warm as July, August continued the overall warm and generally dry summer with the region-wide average véraison occurring on August 11th. Even though the summer was warm and dry, there were very few heat spikes with the warmest period coming during July 20-27 and the highest temperature observed at the Medford station being 107°F on July 25th. September 2013 started off warm and dry, with the exception of 0.53" rain day on September 5th (Medford) and appeared

headed toward a wonderful end to a great growing season. However, from September 17th through the end of the month, conditions shifted to cool and wet, with moderately heavy rain coming from the remnants of a western Pacific typhoon (Pabuk). The result was 2-4" above normal rainfall for September in Southern Oregon, making it the 3rd wettest on record. While October continued the cool trend from September, a blocking ridge of high pressure brought dry conditions resulting in the 9th driest October on record in Southern Oregon. Overall the growing season daily temperature departures observed at the Medford airport weather station were 1.1°F warmer than the 1981-2010 climate normals. Of the four main wine growing regions in Oregon, the Rogue Valley was the lowest above normal of the main stations in Oregon for average temperatures for the 2013 vintage (we have usually been the highest), with Roseburg experiencing the greatest increase from average (2.2°F) during April-October. After the normal precipitation during the dormant period, rainfall during the growing season totaled 5.66" at the Medford station (Figure 1). While this amounts to an average rainfall amount during the growing season, most of it fell during the last couple of weeks in September (2.26" or 40%); otherwise the heart of the growing season was much drier than normal.

From a growing degree-day (GDD) standpoint spring heat accumulation started off similar to 2012 and the average over the 2001-2103 period. However, starting in the third week of April GDD began exceeding the average conditions experienced during any of the periods or the warmest year (2003) shown in Figure 2. The cool last two weeks of September and all of October resulted in GDD in Medford in 2013 that was roughly equal to that experienced in 2003, and the 4th highest observed during the 1928-2013 period. Figure 3 shows the same degree-day data but, instead of cumulative as in Figure 2, it gives the daily accumulation relative to the 1981-2010 and 2001-2013 averages. As is common in most springs, 2013 saw wide swings in heat accumulation during April through June. Daily departures of higher than normal accumulation were greatest during July, while lower than normal accumulation were greatest in late September and October when periods of cloud cover, rain, and cooler than average temperatures were seen. GDD accumulation for 2013 ended up at 3379 for the Medford airport weather station (2755 at the Medford Agri-Met station at SOREC). The 3379 GDD is nearly identical to the warm 2003 vintage, 15% higher than the cool 2011 vintage, and 14% greater than the 1981-2010 climate normals for Medford (Figure 2). Statewide Medford ended up with slightly lower heat accumulation than Milton-Freewater (3466) and more than McMinnville (2428) and Roseburg (3170), which were all much warmer than their respective long term averages.

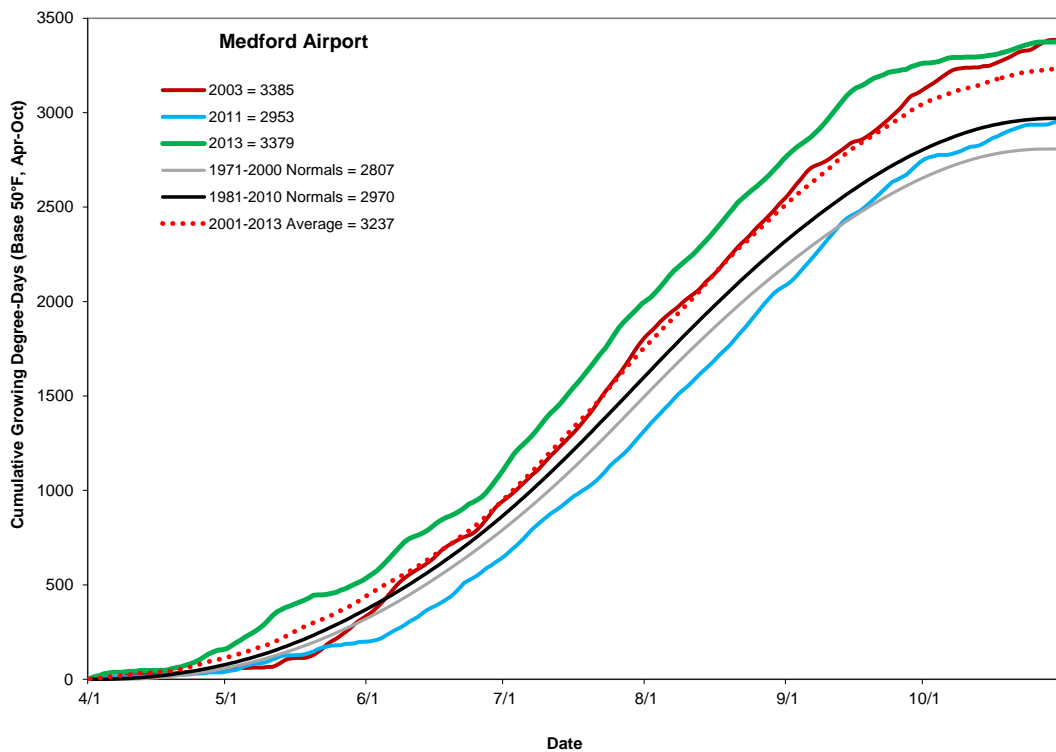


Figure 2 – Growing degree-day accumulation during April-October 2013 from the Medford Airport weather station. The long-term averages shown are for the 1971-2000 climate normals (gray line), 1981-2010 climate normals (black line), the 2001-2013 time period average (red dotted line), 2003 the warmest year since 1998 (red line), and 2011 the coolest year since 1998 (blue line). Data calculated from daily Tmax and Tmin observations for April 1st through October 31st using a base of 50°F with no upper cut-off.

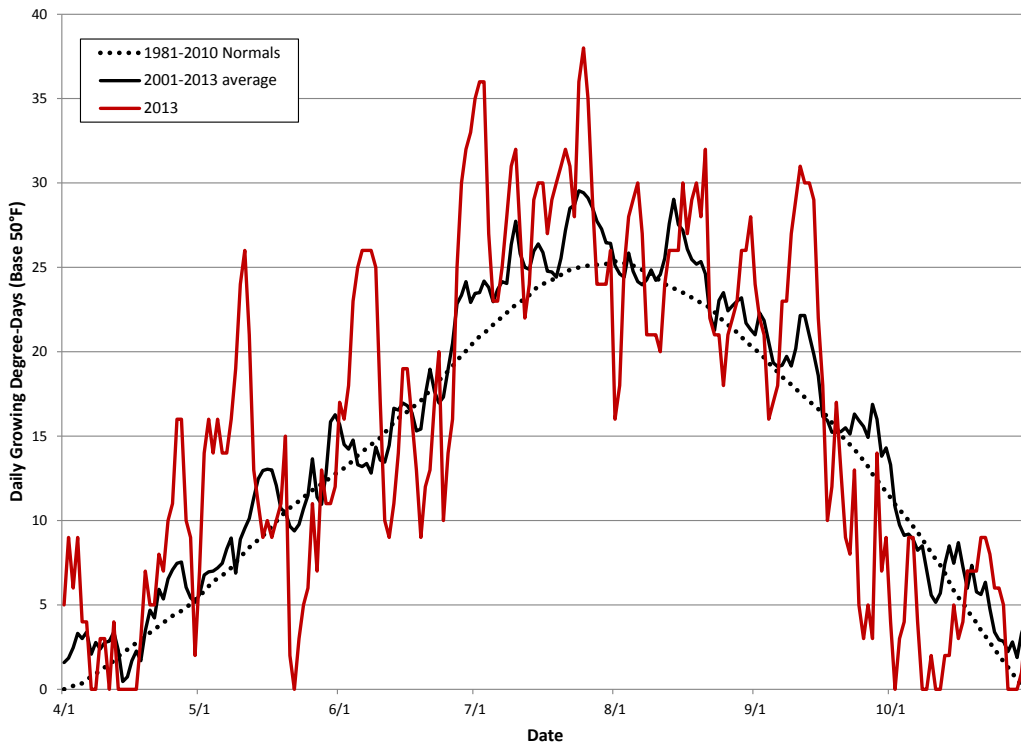


Figure 3 – Same data as in Figure 2, but shown as daily growing degree-day values during April-October 2013 from the Medford Airport weather station (base 50°F). The long-term averages are derived from the 1981-2010 climate normals and the average from the 2001-2013 time period of record.

For the 2013 vintage, site temperature data from the six reference vineyards showed that the average GDD accumulation was 2638 with a standard deviation of 236 units (Table 1). Maximum accumulation was 3032 GDD (Bear Creek Valley site) while the minimum was 2332 GDD (Illinois Valley site). In terms of heat extremes there were 37 days on average with temperatures over 95°F across the region, ranging from a low of 24 days to a high of 46 days (Table 1). Unlike 2010 and 2011, where maximum temperatures rarely reached into the 100s, 2013 saw maximum temperatures reach over 100°F thirteen times for the Medford station, with many of the reference vineyards going over 100°F during the third and fourth weeks of July, during the first three weeks in August, and a few days in the second week in September. The hottest day of the year was on July 26th when an overall reference vineyard average maximum of 103.6°F was observed.

The absolute minimum temperatures during the growing season were relatively warm during the 2013 vintage. The coldest night during the growing season occurred on October 29th with temperatures dipping down to 25.0-30.0°F throughout the region (Table 2). The months of April and May also saw a few separate days when temperatures fell to the upper 20s or low 30s across the sites. Averaged across the regions, the 2013 growing season experienced 17 nights at or below frost levels (32°F) that varied from a low of one night in the Bear Creek Valley to 37 nights in the Illinois Valley. The vast majority of the cold nights came in October. The median last frost in the spring occurred May 1st across the region but like most years there was a wide range from the earliest being March 24th in the Bear Creek Valley to as late as May 2nd in the Applegate and Illinois valleys (Table 1). The median first fall frost occurred on October 3rd, with a range from September 28th in the Illinois Valley to October 29th in the Bear Creek Valley. The resulting frost free period median was 154 days in 2013, ranging 70 days from 149 to 219 days at the shortest and longest reference vineyard sites, respectively.

Comparisons with Previous Years

Compared to past dormant periods at the reference vineyards (starting in 2003-04), the 2012-13 winter was close to average (Table 2). This past winter also had near average number of days below 32°F (82 vs. 79 on average) and dropped to similar absolute minimums as the other years during the 2003-2012 time frame. During the growing season, the 2013 vintage temperatures across the reference vineyards ended up 1.1°F warmer than those experienced in 2010-11. Maximum temperatures were nearly 1.2°F warmer and minimum temperatures just slightly warmer compared to 2012. In terms of heat accumulation, the 2013 growing season GDD at the reference vineyards was slightly higher than the 2003-2012 average (2568), significantly warmer than 2010 and 2011, and the warmest year since the 2009 vintage (Table 2).

During the growing season, absolute maximum temperatures and the number of days over 95°F during 2013 were higher than those experienced in 2012 and near the long term average. The absolute minimum temperatures observed at the reference vineyards during the growing season were significantly warmer than the period average, while the number of days below 32°F was higher than average. The last spring frost date was 2 days later than the time period average, while the first fall frost date was 7 days earlier than the time period average. The result was a frost free period that was 10 days shorter than the long term average observed during 2003-2012 (Table 2).

Table 1 – Rogue Valley reference vineyard dormant season (November 1-March 31, 2012-13) and growing season (April 1-October 31, 2013) climate characteristics. Note that the dormant season minimum temperature value is the average absolute low temperature experienced. Growing degree-days are calculated from April-October 2013 (base of 50°F with no upper cut-off). Note that for the 2013 vintage the data come from fewer sites than the 2003-2010 period (see text for details).

Dormant Season (Nov 1 – Mar 31)	Average	Standard Deviation	Maximum	Minimum	Range
Average Temperature (°F)	40.5	0.4	41.4	40.2	1.2
Absolute Minimum Temperature (°F)	15.2	0.8	16.0	14.0	2.0
# of Days < 32°F	82	14	96	61	35
Growing Season (Apr 1 – Oct 31)	Average	Standard Deviation	Maximum	Minimum	Range
Growing Degree-Days	2638	236	3032	2332	700
Growing Season Average Temperature (°F)	61.9	1.2	63.9	60.4	3.5
Average Maximum Temperature (°F)	81.1	1.9	83.5	78.5	5.0
# of Days > 95°F	37	10	46	24	22
Average Minimum Temperature (°F)	44.5	3.1	48.3	40.7	7.6
# of Days < 32°F	17	14	38	1	37
Median Last Spring Frost (date or days)	5/1	16 days	5/2	3/24	39 days
Median First Fall Frost (date or days)	10/3	14 days	10/29	9/28	31 days
Median Frost Free Period (days)	154	27	219	149	70

Table 2 – Reference vineyard climate comparisons across the dormant (November 1 – March 31, 2012-13) and growing seasons (April 1 – October 31, 2013) for each year of the project. *Note that for the 2012-2013 vintages the data come from fewer sites than the 2003-2010 period (see text for details).

<i>Season/Variable</i>	<i>Year</i>											<i>Average</i>
	<i>2002-03</i>	<i>2003-04</i>	<i>2004-05</i>	<i>2005-06</i>	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11*</i>	<i>2011-12*</i>	<i>2012-13*</i>	
Dormant Season												
Average Temperature (°F)	NA	42.8	41.1	40.3	40.8	39.2	39.9	41.1	40.5	39.6	40.5	40.6
Absolute Minimum Temperature (°F)	NA	18.4	18.1	16.0	9.8	15.0	12.4	8.4	15.3	16.3	15.2	14.5
# of Days < 32°F	NA	51	84	77	77	96	85	65	72	101	82	79
Growing Season	2003	2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*	Average
Growing Degree-Days	2903	2737	2463	2699	2510	2535	2680	2300	2223	2559	2638	2568
Absolute Maximum Temperature (°F)	113.1	111.9	108.9	114.6	110.2	111.5	115.6	111.3	105.1	106.2	108.8	110.7
# of Days > 95°F	47	42	37	40	25	36	36	29	24	30	37	35
Absolute Minimum Temperature (°F)	20.9	30.1	26.4	23.3	21.6	19.7	21.6	21.5	23.3	30.0	25.9	24.0
# of Days < 32°F	10	5	10	17	10	22	16	13	15	5	17	13
Last Spring Frost (date)	5/1	4/2	4/19	5/8	4/27	5/5	4/30	5/6	5/6	5/10	5/1	4/29
First Fall Frost (date)	10/10	10/25	9/25	10/11	9/24	10/9	10/2	10/23	10/25	10/21	10/3	10/10
Frost Free Period (days)	162	206	159	156	150	157	155	170	172	164	154	164

The maximum and minimum temperatures are the absolute values recorded for the entire region for that year and season. Frost dates and the frost free period are the median observed over the entire region for that year.

Phenology:

As with the 2010-12 vintages, the phenology observations for the 2013 vintage come from six sites and six varieties (not all varieties observed at all sites) for a total of 28 observations. This is roughly ¼ of the number of phenology observations from the full project during the 2003 to the 2009 vintages. While this will create differences in the overall statistics, a test of these six sites versus the entire 20 sites during previous years finds no significant difference in the phenology means, indicating that these six sites generally represent the larger suite of sites.

Summarizing the phenological observations for the entire region and across all varieties shows an average bud break of April 15th (Table 3). Bud break was observed over a 17 day period for all varieties and sites, being as early as April 7th and as late as April 24th. Flowering occurred June 8th on average with 24 days between the earliest (May 29th) and latest (June 21st) sites across the region and over all varieties. Véraison and the start of the ripening phase occurred over a 20-day period during the first through third weeks of August (averaging August 11th). The earliest véraison was observed on August 2nd while the latest was observed on August 22nd. Harvest dates ranged over 43 days from September 14th to October 27th across varieties and sites with an average date of September 26th (Table 3).

Average intervals between phenological events (an important measure of vine and berry development timing) shows that bud break to flowering was 55 days on average; that flowering to véraison was 66 days on average; and that véraison to harvest was 50 days on average (Table 3). These intervals had 6 to 14 day standard deviations across sites and varieties, but a very wide range between the shortest and longest intervals due to site differences. For 2013, the length of the bud break to harvest period averaged 165 days with 46 days between the shortest and longest. It should be noted that the median bud break to harvest length of 165 days is very similar to the median frost free period of 164 days (Table 2).

Table 3 –Phenological date and interval characteristics for the 2013 vintage averaged over sites and varieties. Note that for the 2010-2013 vintages the data come from fewer sites (see text for details).

<i>Event/Interval</i>	<i>Median</i>	<i>Standard Deviation</i>	<i>Latest or Longest</i>	<i>Earliest or Shortest</i>
Bud Break	April 15	4 days	April 24	April 7
Flowering	June 8	6 days	June 21	May 29
Véraison	August 11	6 days	August 22	August 2
Harvest	September 26	13 days	October 27	September 14
Bud Break to Flowering	55 days	6 days	67 days	45 days
Flowering to Véraison	66 days	6 days	75 days	57 days
Véraison to Harvest	50 days	14 days	81 days	30 days
Bud Break to Harvest	165 days	14 days	196 days	150 days

Comparisons with Previous Years

The main phenological events (six sites only) for the 2013 vintage were earlier than average when compared to the previous ten vintages (Table 4). The median bud break was five days earlier than average and 17 and 9 days earlier than that observed in 2011 and 2012, respectively. Bloom was one week earlier than the period average, with similar site and variety variation (6 days), but over two weeks earlier than the 2011 vintage. Median véraison dates during 2013 were nine days earlier than average, varying by +/- 6 days over sites and varieties. The 2013 median harvest date was 15 days earlier than average and nearly month earlier than the cool 2010 and 2011 vintages.

Table 4 – Reference vineyard average phenology comparisons for the 2003 to 2013 vintages. *Note that the 2010-2013 vintage numbers come from fewer sites and varieties than the previous years (see text for details).

<i>Stage or Interval</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010*</i>	<i>2011*</i>	<i>2012*</i>	<i>2013*</i>	<i>Average</i>
Bud Break												
Median	4/18	4/2	4/15	4/25	4/19	4/30	4/23	4/20	5/2	4/24	4/15	4/20
Standard Deviation	10 days	8 days	10 days	9 days	10 days	9 days	10 days	9 days	10 days	4 days	4 days	9 days
Flowering												
Median	6/11	6/4	6/19	6/12	6/10	6/22	6/15	6/27	7/1	6/16	6/8	6/15
Standard Deviation	10 days	6 days	7 days	6 days	7 days	8 days	8 days	8 days	6 days	5 days	6 days	7 days
Véraison												
Median	8/20	8/11	8/22	8/16	8/16	8/24	8/20	8/31	9/3	8/22	8/11	8/20
Standard Deviation	7 days	6 days	9 days	6 days	6 days	7 days	8 days	7 days	9 days	8 days	6 days	7 days
Harvest												
Median	10/7	10/1	10/19	10/9	10/9	10/14	10/7	10/26	10/26	10/7	9/26	10/11
Standard Deviation	12 days	10 days	10 days	12 days	12 days	9 days	13 days	12 days	6 days	12 days	14 days	11 days
Bud Break to Flowering												
Median	52 days	64 days	65 days	48 days	52 days	51 days	52 days	66 days	57 days	53 days	55 days	56 days
Standard Deviation	10 days	7 days	10 days	9 days	10 days	7 days	8 days	9 days	11 days	6 days	6 days	9 days
Flowering to Véraison												
Median	69 days	68 days	64 days	67 days	68 days	65 days	64 days	66 days	66 days	63 days	66 days	66 days
Standard Deviation	9 days	9 days	9 days	6 days	8 days	9 days	8 days	10 days	6 days	6 days	6 days	8 days
Véraison to Harvest												
Median	48 days	50 days	59 days	52 days	54 days	52 days	47 days	57 days	50 days	43 days	50 days	51 days
Standard Deviation	8 days	10 days	11 days	11 days	11 days	9 days	12 days	14 days	9 days	10 days	14 days	11 days
Bud Break to Harvest												
Median	172 days	186 days	189 days	168 days	174 days	166 days	163 days	188 days	175 days	168 days	165 days	174 days
Standard Deviation	15 days	12 days	14 days	14 days	14 days	11 days	16 days	15 days	9 days	13 days	14 days	13 days

For the 2013 vintage the average time between bud break and bloom of 55 days was one day less than average but substantially shorter than those observed in 2010 and 2011, where the coolest springs in many years were experienced (Table 4). The bloom to véraison period averaged 66 days in 2013, showing the most consistent average phenological stage lengths from year to year. The average length of time between véraison and harvest was 50 days in 2013, one day shorter than the long term average, but seven days longer than the 2012 vintage ripening conditions. The average bud break to harvest interval of 165 days in 2013 was shorter than average by 9 days, and over 20 days shorter than observed during 2010.

Composition:

Similar to the 2010-12 vintages, the harvest data for the 2013 vintage come from six sites and six varieties (not all varieties observed at all sites) for a total of 28 observations. This is roughly ¼ of the number of harvest composition and yield observations from the full project during the 2003 to the 2009 vintages. While this will create differences in the overall statistics, a test of these six sites versus the entire 20 sites during previous years finds no significant difference in the harvest composition and yield means, indicating that these six sites generally represent the larger suite of sites.

For the 2013 vintage, grower-submitted harvest composition values reflect the warmer season showing an average 24.2 °Brix with a range from 22.3 to 26.8 °Brix across sites and varieties (Table 5). Harvest titratable acidity averaged 6.3 g/L with a minimum of 4.1 g/L to a maximum of 9.4 g/L while pH numbers averaged 3.45 with range from 3.30 to 3.74 over all sites and varieties. Yields averaged 3.6 tons/acre across the sites and varieties, ranging 4.5 tons/acre from a low of 2.5 to a high of 6.0 tons/acre (Table 5).

Table 5 –Harvest composition characteristics for the 2013 vintage averaged over sites and varieties.

<i>Region</i>	°Brix	TA (g/L)	pH	Yield (T/acre)
Median	24.2	6.3	3.45	3.6
Standard Deviation	1.1	1.6	0.15	1.2
Maximum	26.8	9.4	3.74	6.9
Minimum	22.3	4.1	3.30	2.5

Comparisons with Previous Vintages

The 2013 vintage harvest composition values from the six sites give a general comparison with the 2003 through 2012 vintages (Table 6). Average °Brix values of 24.2 were higher than the eleven year average. Average titratable acidity of 6.3 g/L was right at the period average (6.2 g/L) but moderately higher than observed in the 2012 vintage. In parallel with the average acid levels, the pH in the 2013 vintage was right at average but with slightly higher than normal site and variety variation. Yields reported from the sites show that the 2013 vintage was substantially up over the 2012 vintage (+24%), but slightly lower than the large 2011 vintage (-8%) and above the eleven year average (+20%). The large range of 4.5 tons/acre across sites and varieties in 2013 was moderately higher than past vintages (Table 5).

Table 6 – Reference vineyard average harvest composition comparisons for the 2003 to 2013 vintages. *Note that the 2010-2013 vintage numbers come from fewer sites and varieties than the previous years.

<i>Parameter</i>	<i>Harvest Numbers</i>											<i>Average</i>
	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010*</i>	<i>2011*</i>	<i>2012*</i>	<i>2013*</i>	
°Brix	24.4	24.5	23.4	24.1	23.6	23.9	23.5	23.2	23.8	24.0	24.2	23.9
TA (g/L)	6.1	5.8	6.3	5.9	6.3	6.2	5.9	7.1	7.0	5.5	6.3	6.2
pH	3.42	3.49	3.39	3.50	3.37	3.43	3.55	3.47	3.42	3.56	3.45	3.46
Yield ¹	2.9	2.6	2.8	3.1	3.2	3.0	2.9	2.2	3.9	2.9	3.6	3.0

¹ Tons per acre

Conclusions:

While the 2013 vintage will go down as one of the warmest on record in Southern Oregon, it will largely be remembered for a two week stretch of abnormally cold and wet conditions during late September. Plant growth and fruit ripening were proceeding in wonderful conditions and it appeared as though it might be one of the earliest harvests on record. Although the cool and wet conditions in the second half of September slowed things down and presented various challenges to harvest, October provided the dry conditions necessary to complete a good harvest. The 3379 GDD as measured at the Medford airport station is 4th highest observed during the 1928-2013 period, and is most comparable to 2003 and 2006.

The reference vineyard temperature observations reflect the general conditions seen across Oregon and the region. The dormant period was close to normal in terms of average temperatures and days below 32°F, while not as severe in terms of the absolute minimum. The spring was warm across the sites with mild frost pressure; however some sites saw a light frost in the first few days of May. Growing degree-day accumulation averaged 2638 over the sites, which was above the long term average from 2003-2013 time period. Heat extremes above 100°F were relatively low during 2013, but the number of days above 95°F was slightly higher than average. Phenological observations from the sites showed earlier than average growth and ripening timing, a stark contrast to the very late conditions of the 2010 and 2011 vintages. The intervals between growth stages remained generally consistent compared to other years. Basic composition values reflect the warmer than normal vintage with °Brix levels higher than average and near average acid levels and pH values. However, yields were up significantly from 2012 and higher than the time period average.

Grower comments tended to reflect the overall warmth of the vintage, with one comment saying “ideal season – give me more like this please.” Comments reveal that overall bloom and fruit set were nearly ideal for most early and mid-varieties with a very quick bloom period, while later varieties were impacted some by rain during the third week in June (Figure 1). Overall the general impression from growers was that set was good with cluster numbers and weights up across most varieties. In terms of bird pressure, growers noted that it was a two stage season where if you picked early, before the late September rains, then bird pressure was very low to non-existent. However, if you picked later in October, bird pressure appeared to many growers to be higher than normal. Other pest pressure was also stated being variable with some mentioning that leaf hopper numbers were the highest ever, many also said that mite pressure was heavy during the spring, and that mealybug pressure was low to average. Comments concerning disease issues tended to indicate a very low pressure year for most, but a few growers mentioned that it was a tricky year in terms of botrytis after the rains in late September.

The warmer conditions in 2012 and 2013 throughout the western US has been linked to a slight rebound in sea surface temperatures over both the North and Tropical Pacific Ocean. The shift from La Niña to neutral conditions in the tropics and slightly warmer coastal waters from British Columbia south to Baja has brought conditions back to normal or warmer than normal over the western US. The warmer sea surface temperatures resulted in a more normal marine layer along the coast, slightly lower humidity levels in the atmosphere and much higher minimum and slightly higher maximum daytime temperatures over the western US.

Given the swings in conditions over the last few years, what does the winter of 2013-14 and the spring of 2014 hold for our region? There is ample evidence that neither El Niño nor La Niña conditions in the Tropical Pacific will be present this winter and into the spring of 2014. Combined with a somewhat neutral to slightly warm North Pacific conditions we are likely to see a little bit of everything this winter

as evidenced already by the record-setting wet September followed immediately by a long spell of dry weather in October, followed by the record cold in early December. Large variability in month-to-month weather is common in years where there is no clear signal of sea surface temperatures in the Tropical Pacific. Conditions during the late winter and into spring of next year will depend on how the dynamic patterns of sea surface temperatures in the Pacific play out and how the Tropical to Arctic circulation of the atmosphere responds. As ocean and atmospheric conditions over the next 2-3 months unfold we will have a much better picture of what the spring of 2014 will bring to Oregon and the rest of the western US. Further updates will be provided as more information becomes available.

Future Work

- The observation network will continue with the reduced number of sites (six) and focus on site temperatures, phenology, and harvest composition and yields for the foreseeable future.
- An overview presentation will be given at the annual meeting of the Rogue Valley Winegrowers Association which is typically held in late January or early February (see newsletter and web site announcements for further details).
- The results will also be used to provide a Southern Oregon component to the Oregon Wine Symposium's "Vintage Overview" session during February 25-26, 2014 in Portland at the Oregon Convention Center.
- A synthesis report with further in-depth analyses of the study will be compiled and made available as more data are gathered and processed.

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