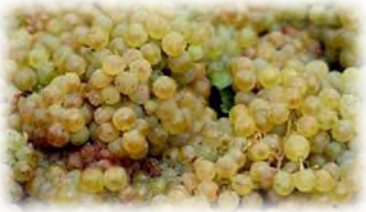
The Past, the Present, and the Future













Gregory V. Jones
Department of Environmental Studies

Southern OREGON UNIVERSITY

Outline of Talk

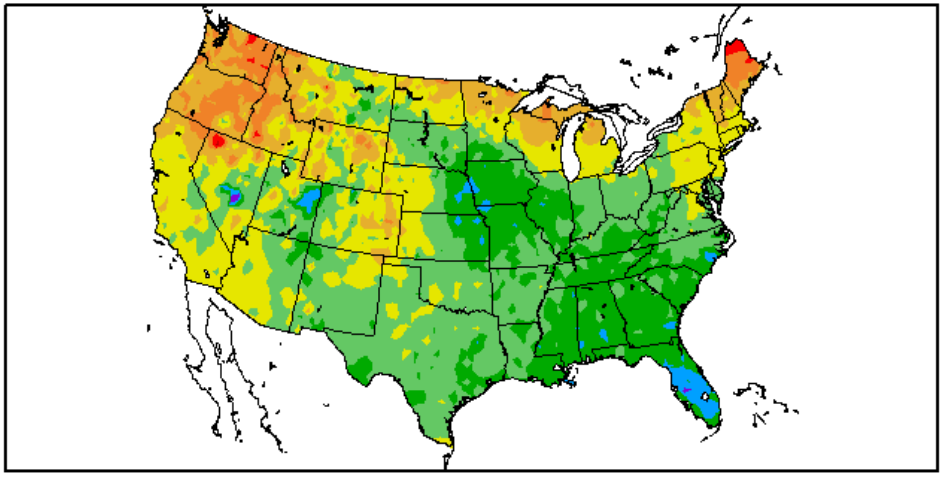
- The Past
  - Vintage 2010
- The Present (or close to it)
  - Statistical Update for the Region
- The Future (short term)
  - Forecast for 2011

The Past

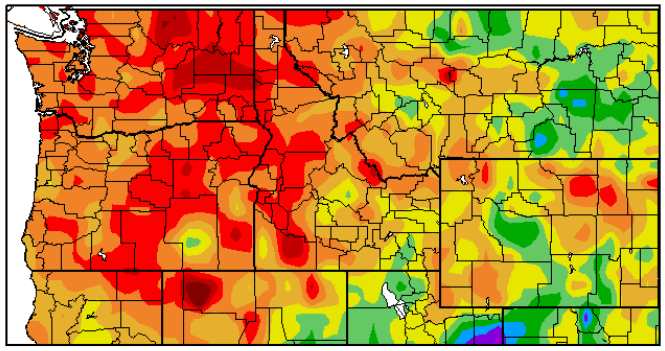
National, PNW, and Oregon Wine Region Climates for 2010

US and PNW Temperature Departures from Normal for Spring/Early Summer 2010

Departure from Normal Temperature (F)
1/1/2010 – 1/31/2010

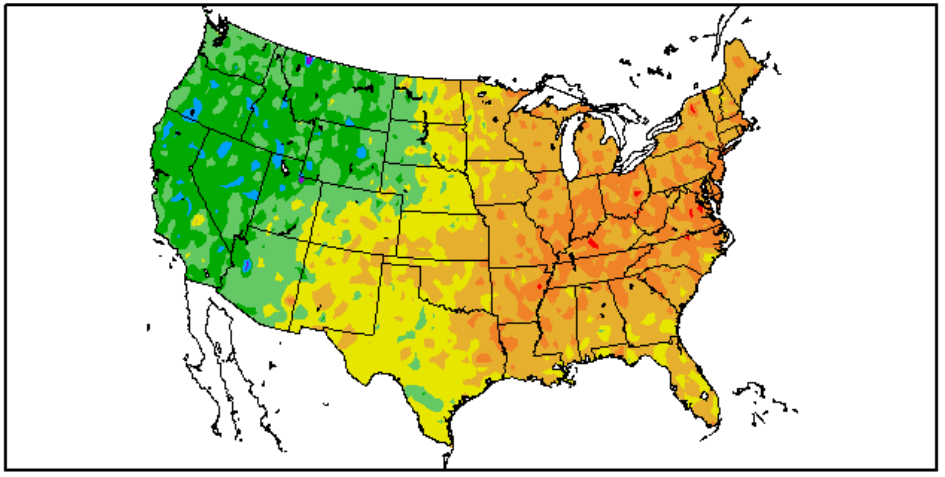


−15 −12 −9 −6 −3 0 3 6 9 12 15

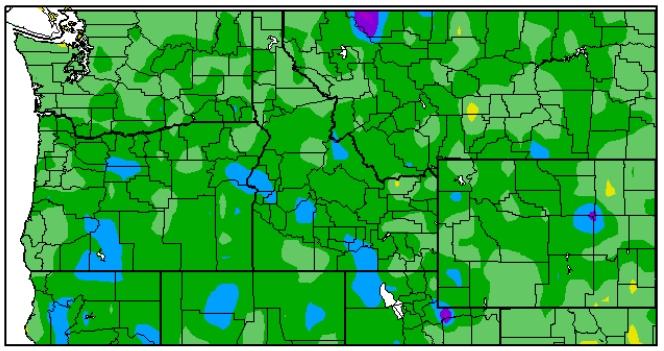


−10 −8 −6 −4 −2 0 2 4 6 8 10

Departure from Normal Temperature (F)
4/1/2010 – 6/30/2010

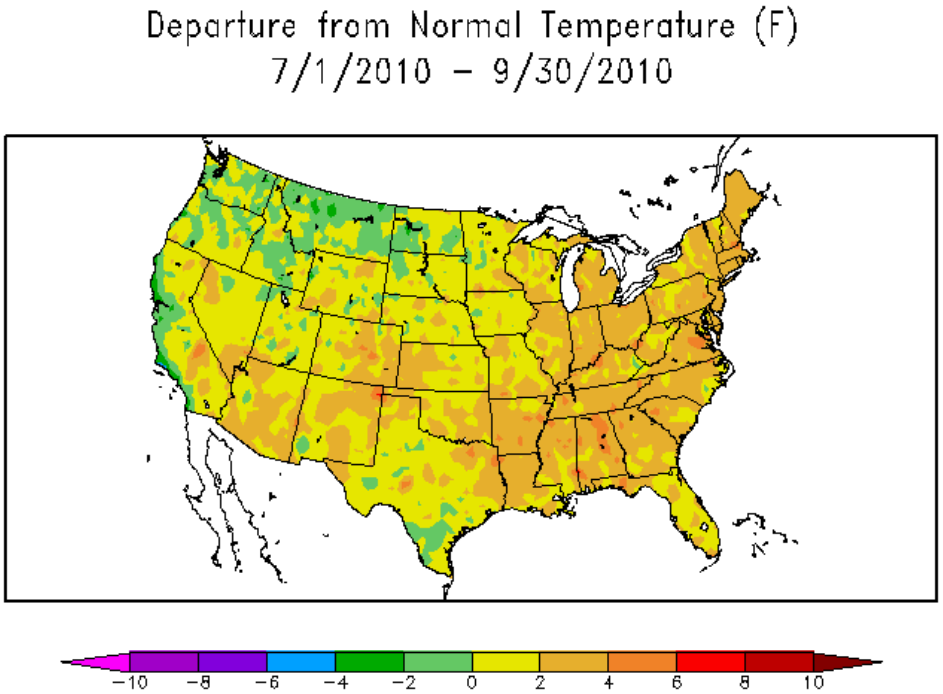


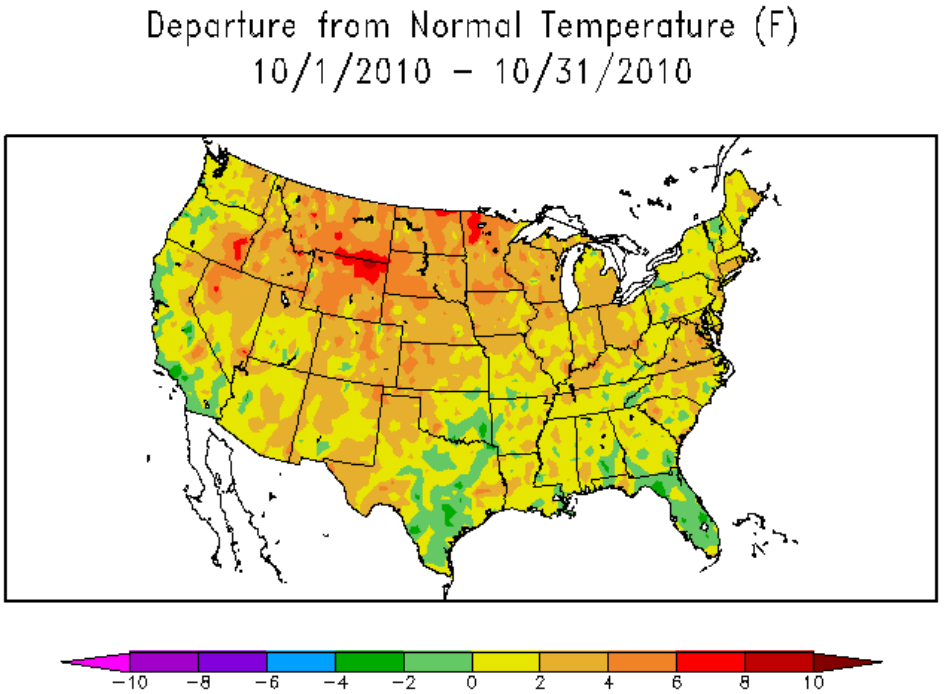
−10 −8 −6 −4 −2 0 2 4 6 8 10



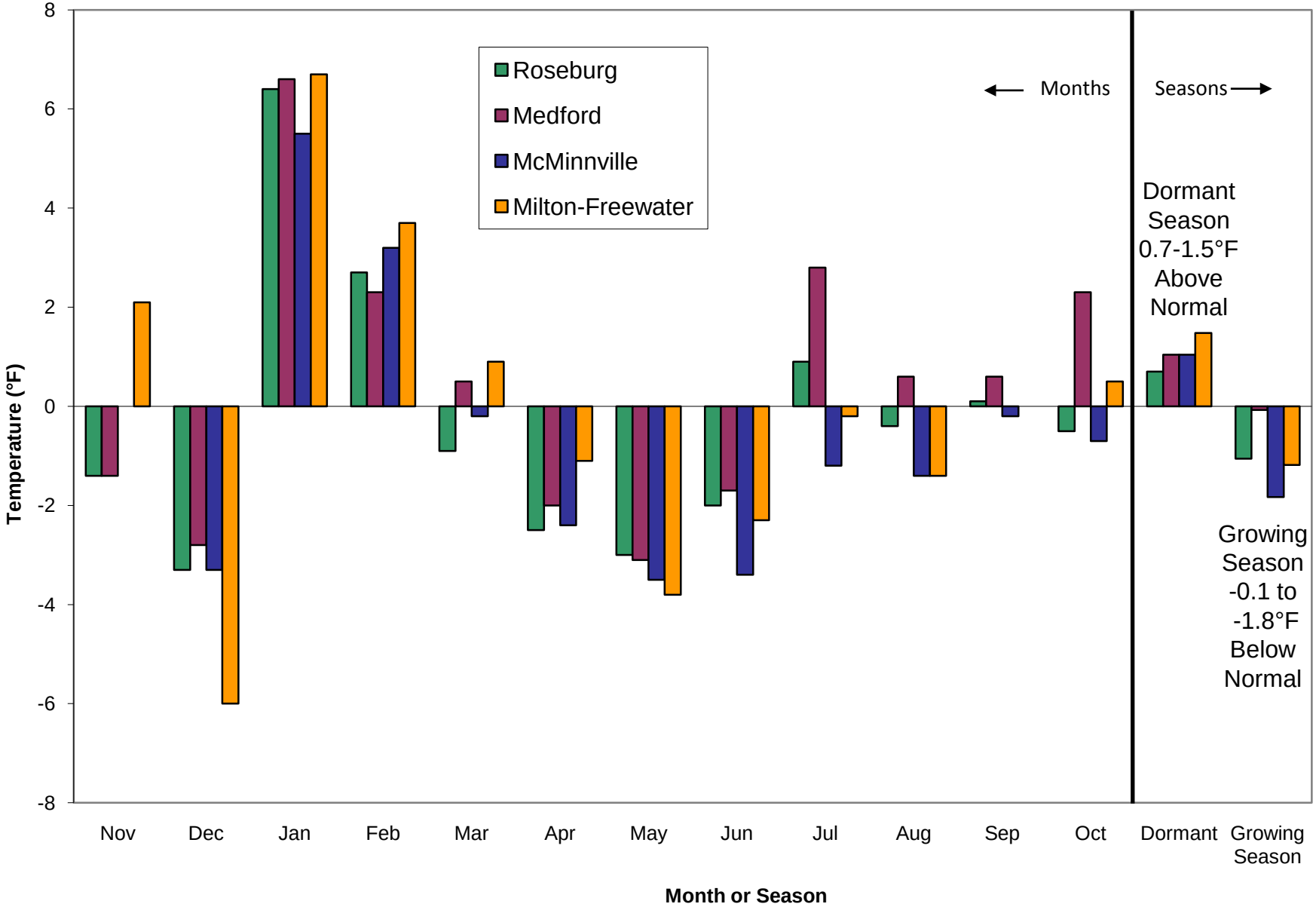
−10 −8 −6 −4 −2 0 2 4 6 8 10

US and PNW Temperature Departures from Normal for Late Summer/Early Fall 2010



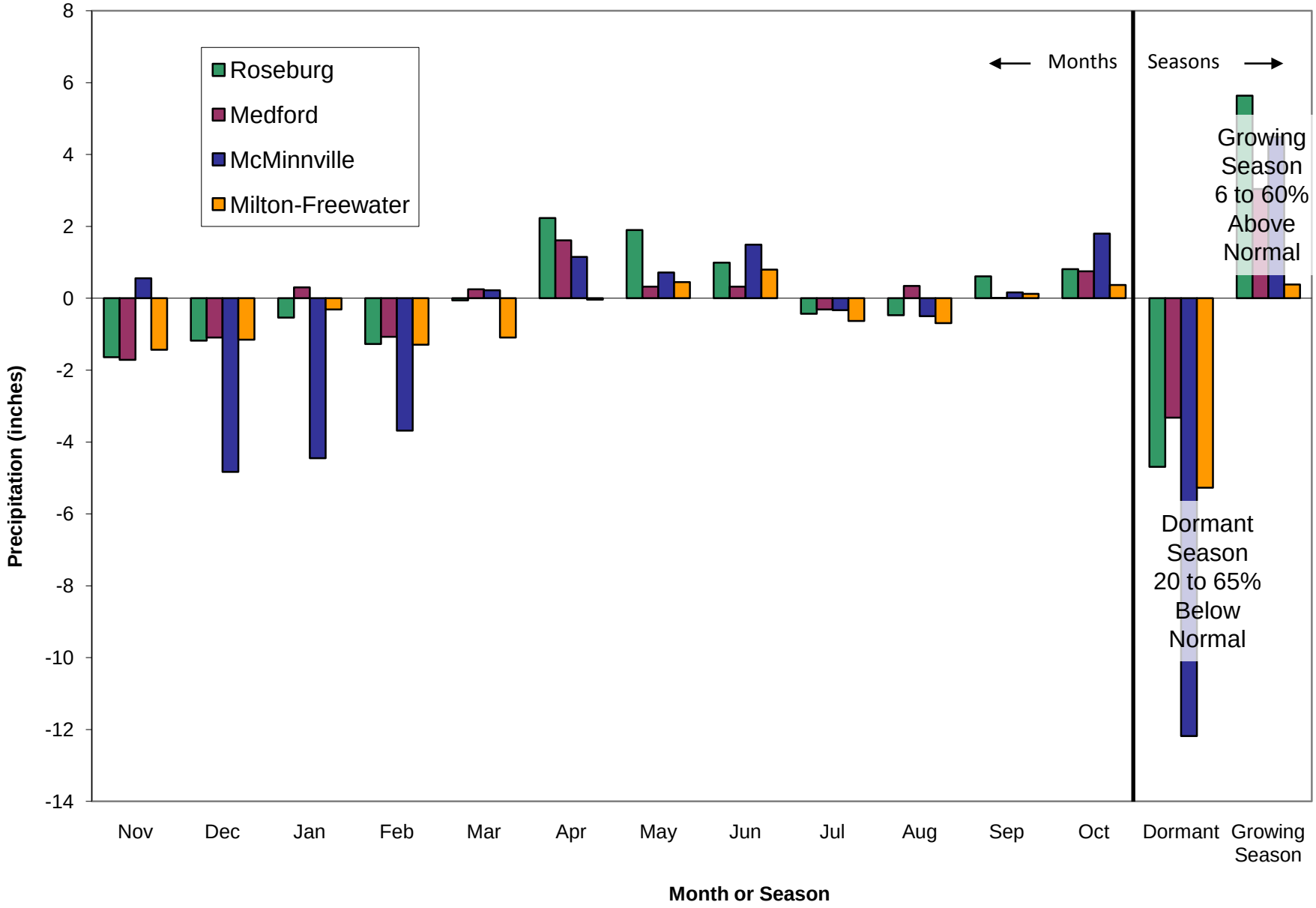


2009-10 Regional Temperature Departures from Normal



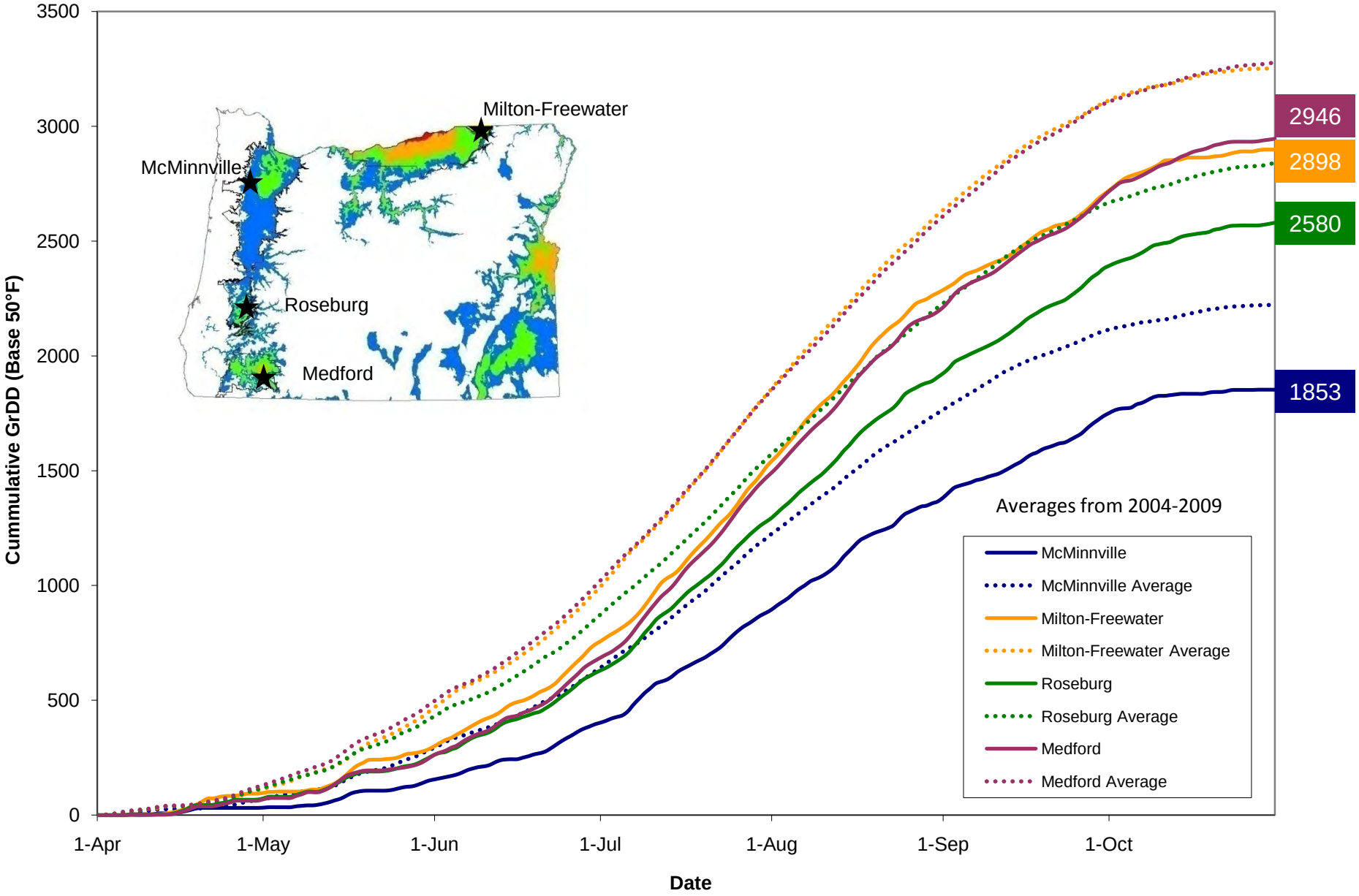
This chart represents a summation of daily temperature departures by month compared to the 1971-2000 climate normals period for the dormant period (Nov-Mar) and the growing season (Apr-Oct) from the NWS stations (www.noaa.gov)

2009-10 Regional Precipitation Departures from Normal



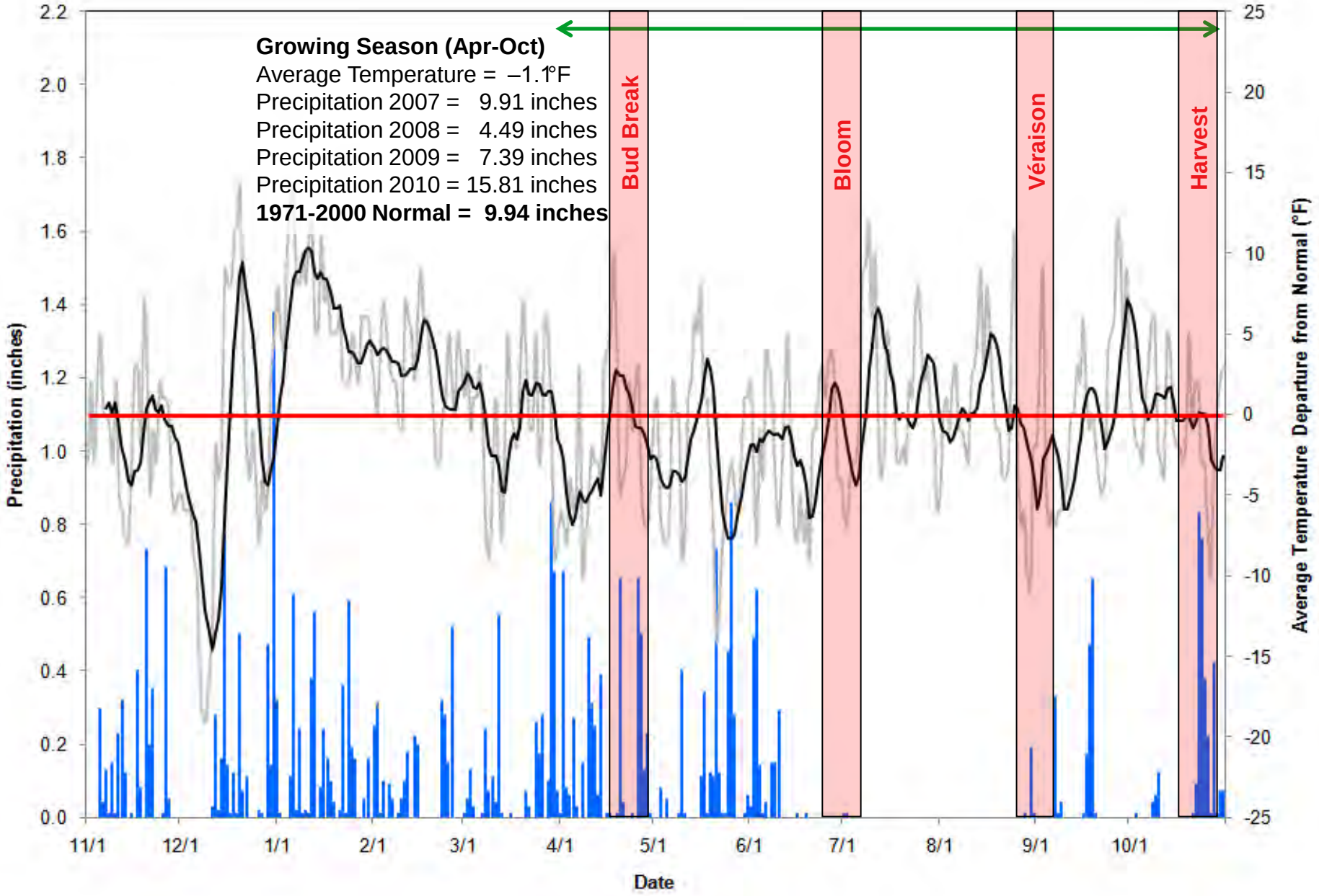
This chart represents a summation of daily temperature departures by month compared to the 1971-2000 climate normals period for the dormant period (Nov-Mar) and the growing season (Apr-Oct) from the NWS stations (www.noaa.gov)

2010 Growing Season Cumulative Degree-Days



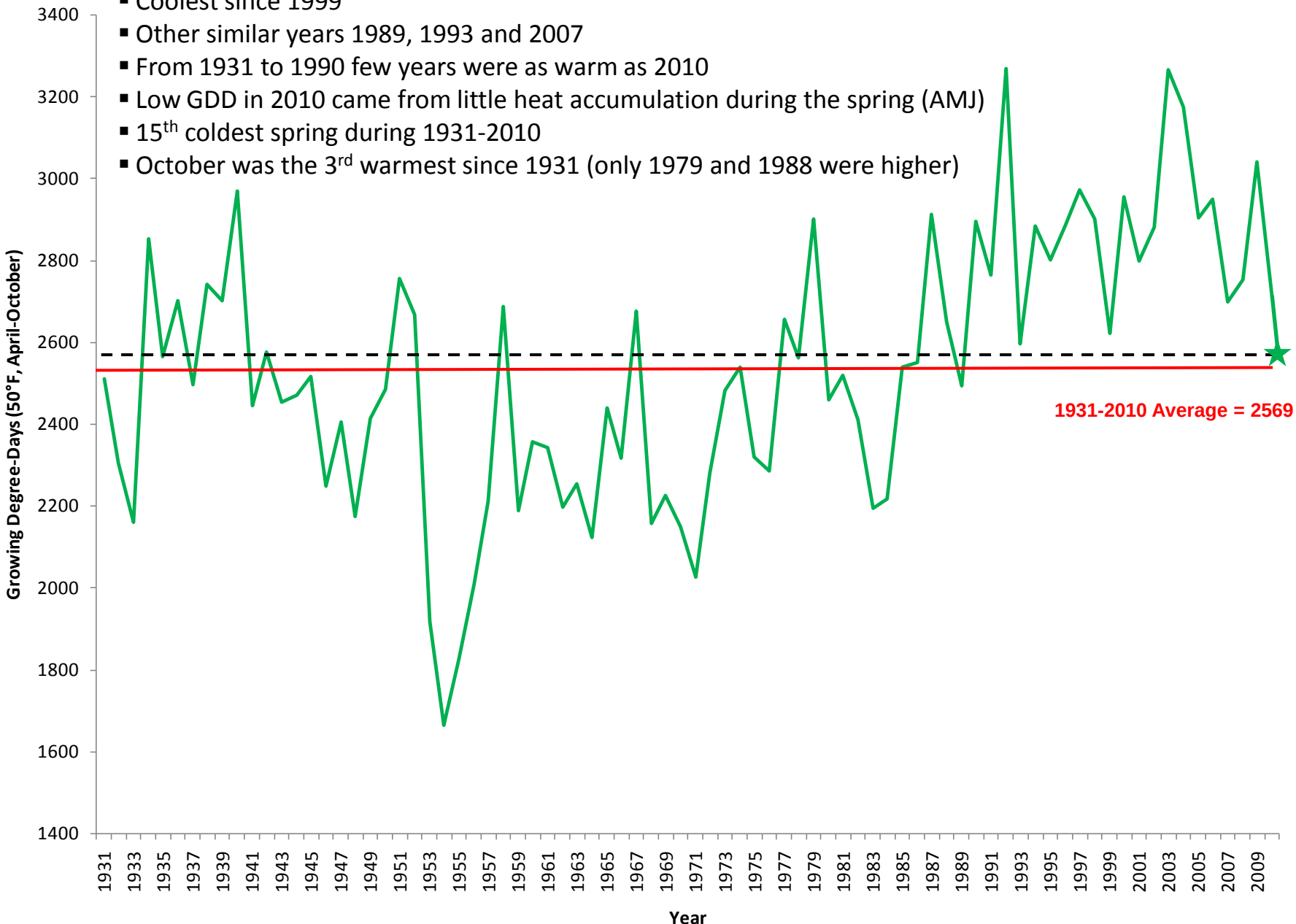
This chart represents the 2010 cumulative growing degree-days compared to the five year average for 2004-2009 for the growing season (Apr-Oct) from the NWS stations (www.noaa.gov)

Roseburg 2009-10 – Temperature Departures from Normal and Precipitation



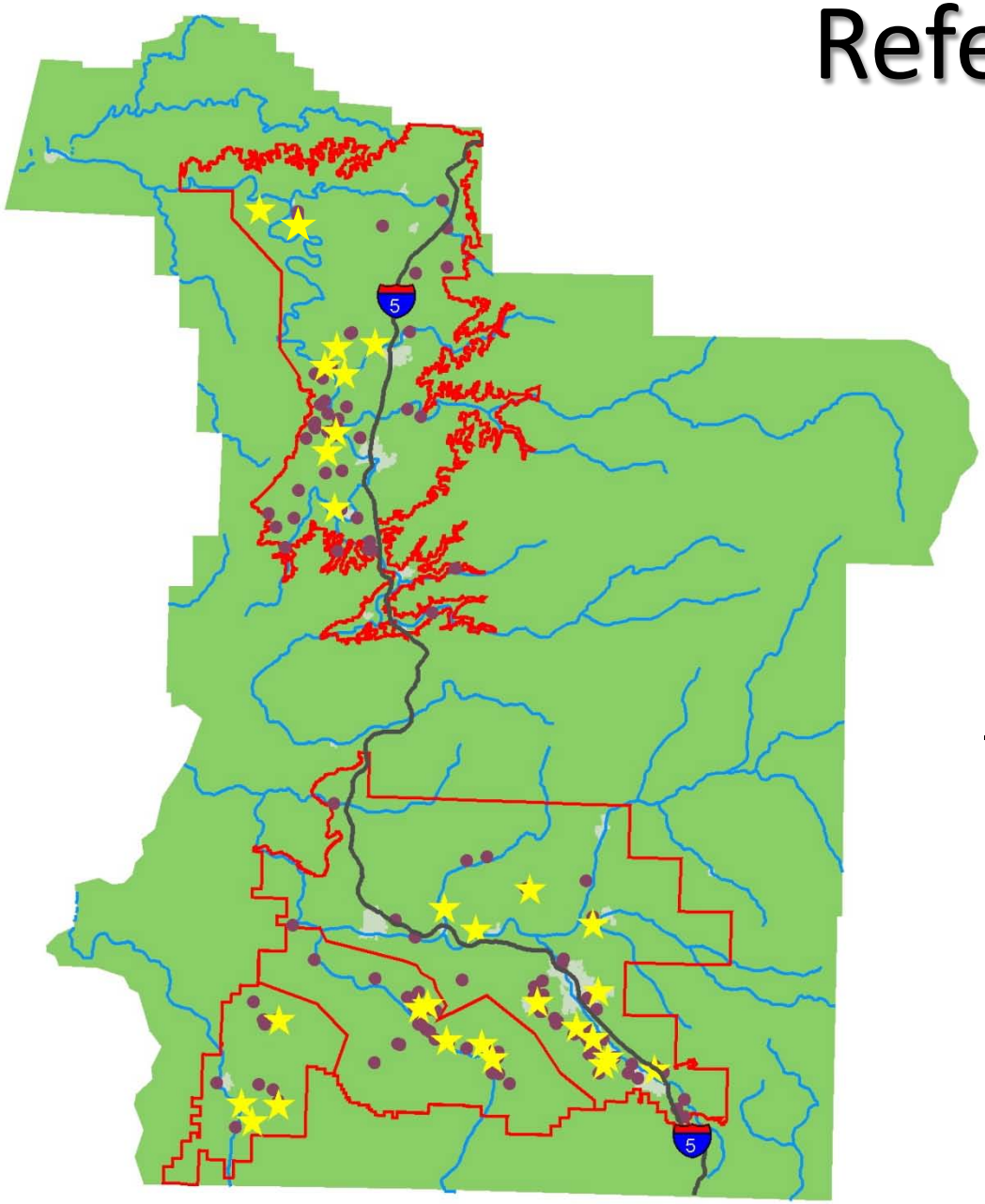
Roseburg 1931-2010 – Growing Degree-Days

- Coolest since 1999
- Other similar years 1989, 1993 and 2007
- From 1931 to 1990 few years were as warm as 2010
- Low GDD in 2010 came from little heat accumulation during the spring (AMJ)
- 15th coldest spring during 1931-2010
- October was the 3rd warmest since 1931 (only 1979 and 1988 were higher)



Reference Vineyard Vintage 2010

Reference Vineyards



Established:

Rogue and Applegate Valleys
20 Vineyards in 2003

Umpqua Valley
9 Vineyards in 2004

Purpose:

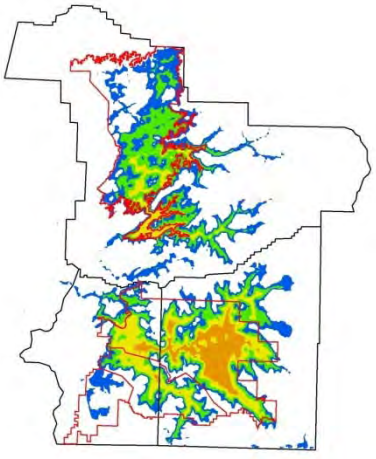
Develop a baseline understanding of temporal and spatial variations in climate, plant growth potential, and fruit ripening characteristics

Umpqua Reference Vineyards 2004-10
Growing Degree-Days (Apr-Oct)

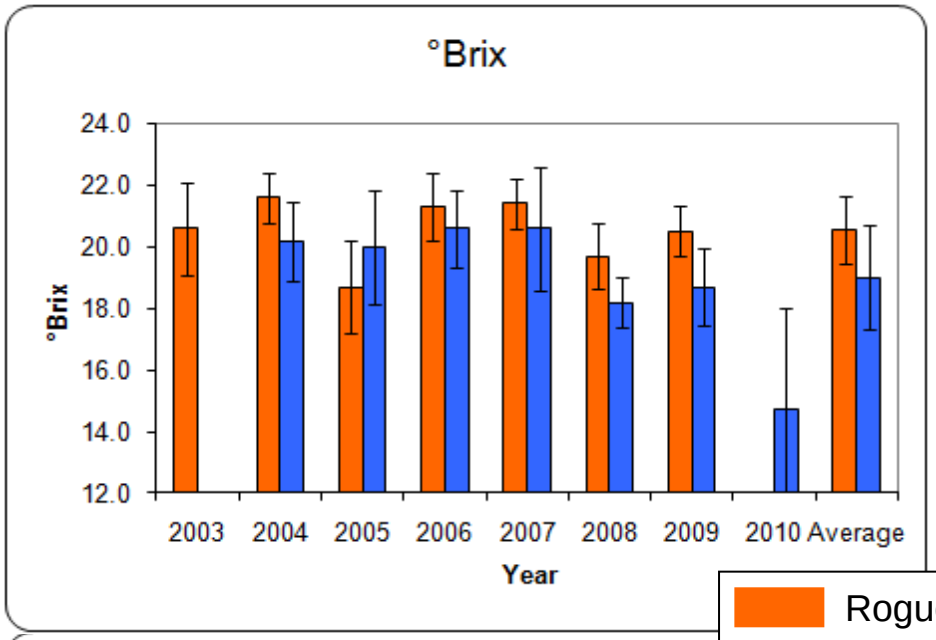
Statistic	2005	2006	2007	2008	2009	2010	Average
Mean	2302	2458	2144	2243	2384	2039	2262
Std Dev	227	283	290	252	245	264	260
Maximum	2532	2840	2484	2521	2702	2290	2562
Minimum	1821	1913	1626	1717	1904	1485	1744
Range	711	927	858	804	798	805	817

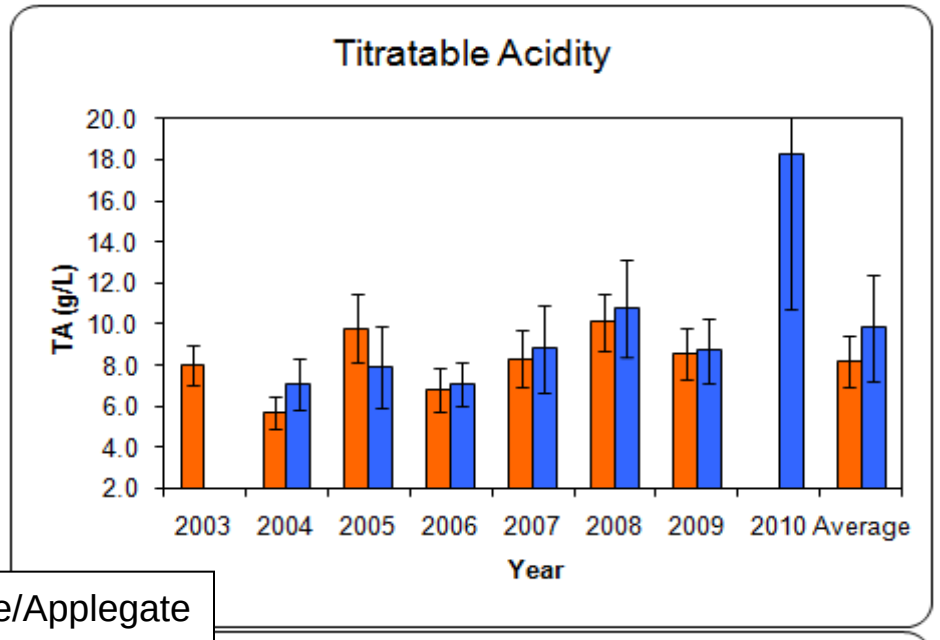
Regional 2004-10
Growing Degree-Days (Apr-Oct)

Region	2005	2006	2007	2008	2009	2010	Average
Umpqua	2302	2458	2144	2243	2384	2039	2262
Bear Creek	2601	2913	2702	2738	2936	2505	2733
Valley of the Rogue	2510	2739	2625	2567	2746	2361	2591
Applegate	2437	2590	2427	2473	2546	2152	2438
Illinois	2207	2424	2165	2223	2334	2069	2237



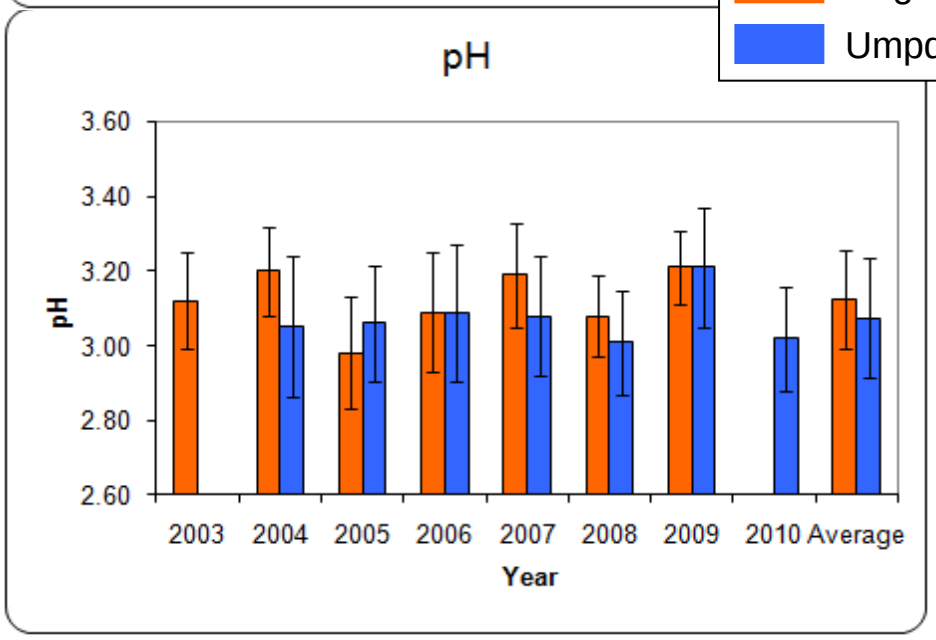
2003-2010 Sample Composition (Sept 13th)

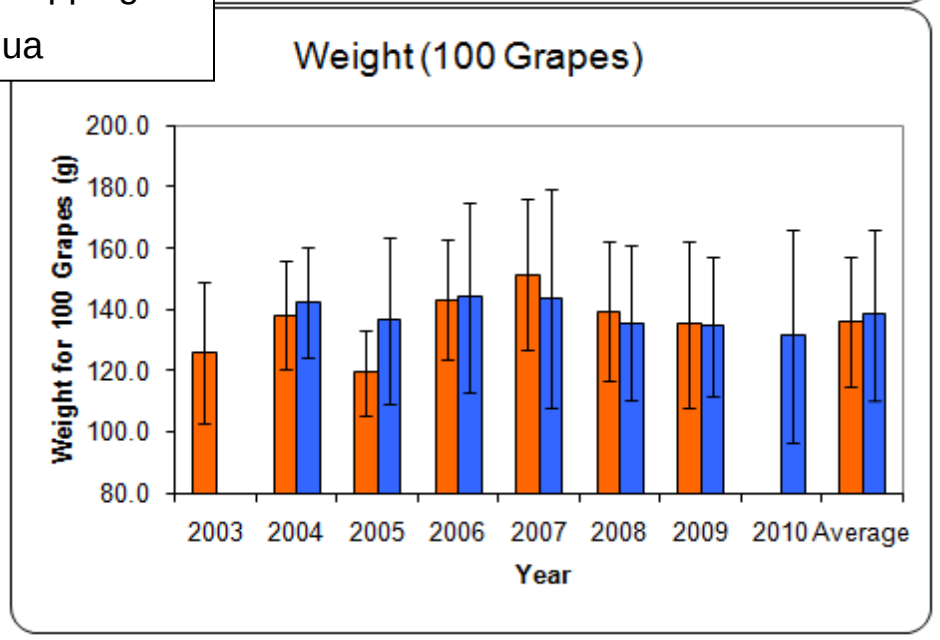




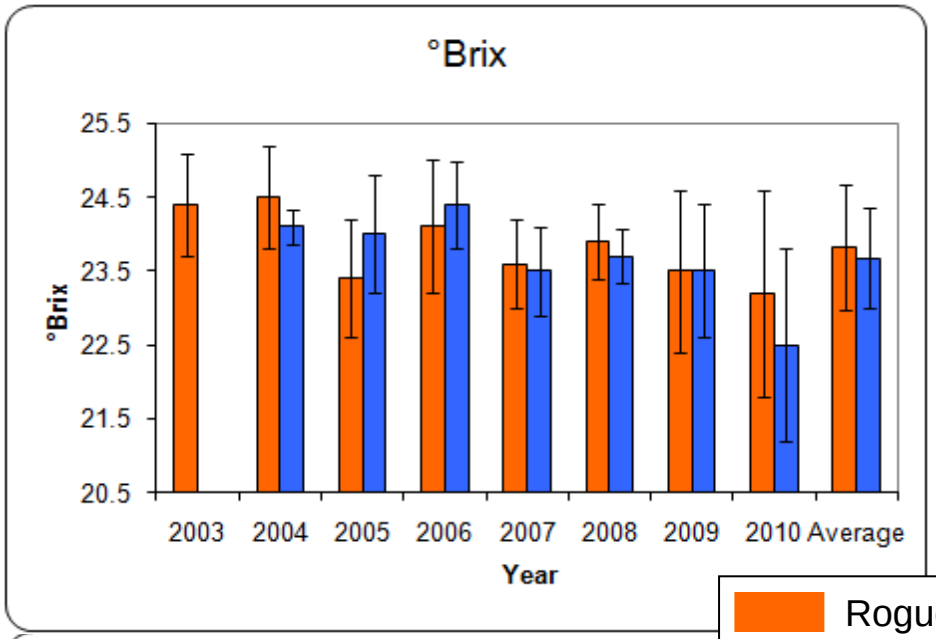
Rogue/Applegate

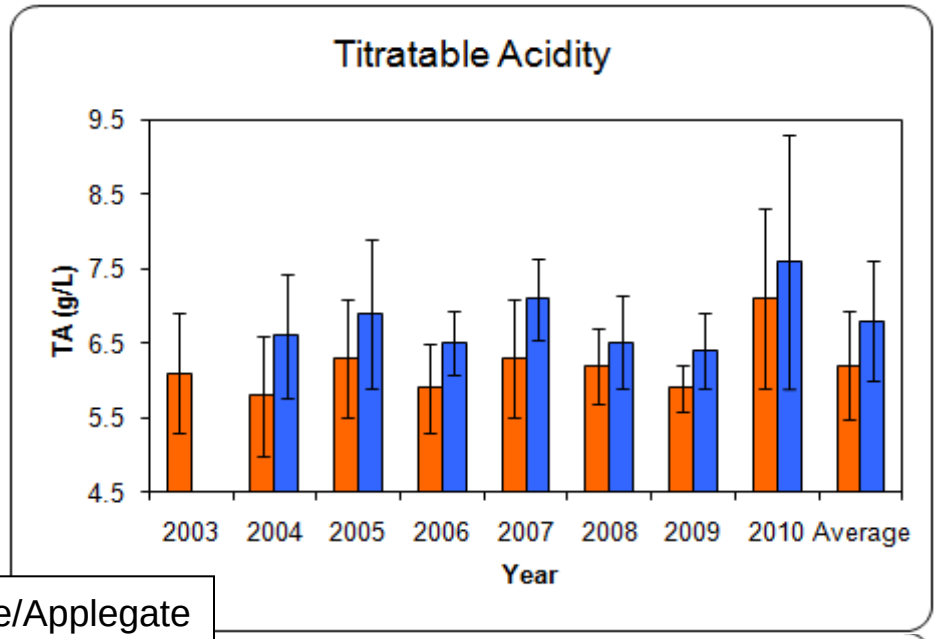
Umpqua

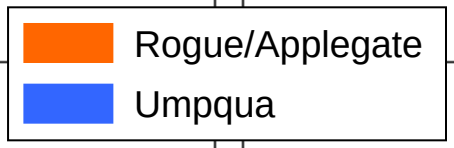


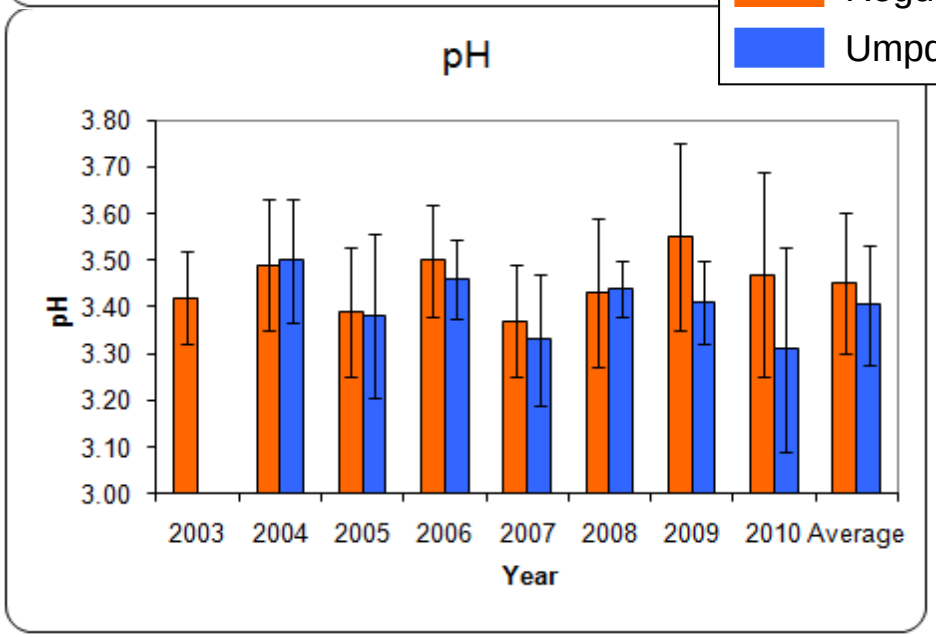


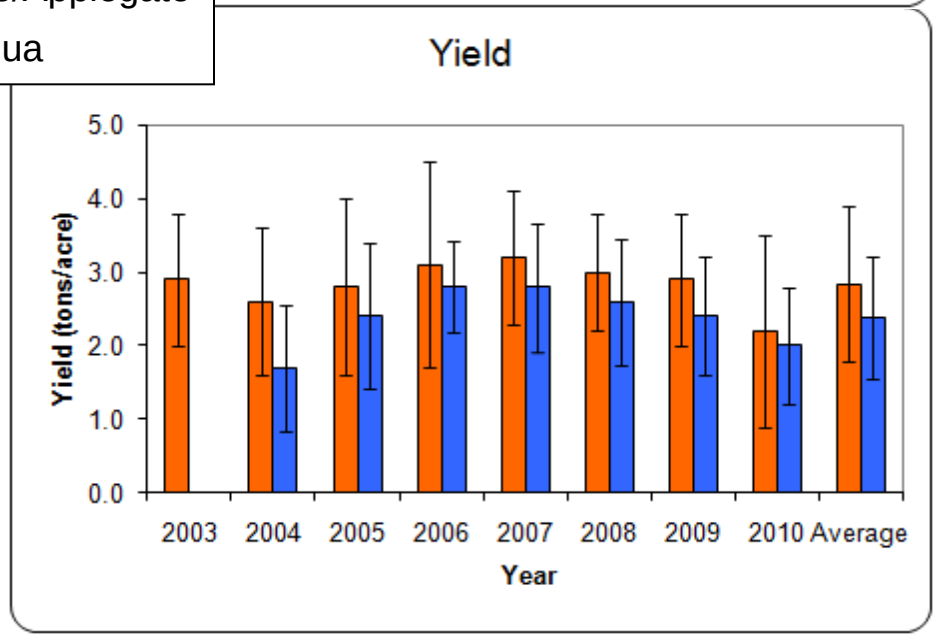
2003-2010 Harvest Composition











Vintage 2010 Summary

Weather/Climate

- Deep cold snap December 6-11, temperatures dropped to 8.8-12.9°F across sites
- Spring frost pressure was low, but mild frost events into the first week of May
- Maximum temperatures significantly lower than average (average minimums), resulting in fewer days > 95°F and fewer heat spikes than average
- Heat accumulation averaged 2039 GDD (ranged from 1485-2290 GDD)
- Most sites did not experience a fall frost before October 31st

Phenology

- Bud break slightly late but wide variations across sites and varieties
- Bloom 2-3 weeks late
- Véraison 10-20 days late
- Harvest late by ten days or more

Composition

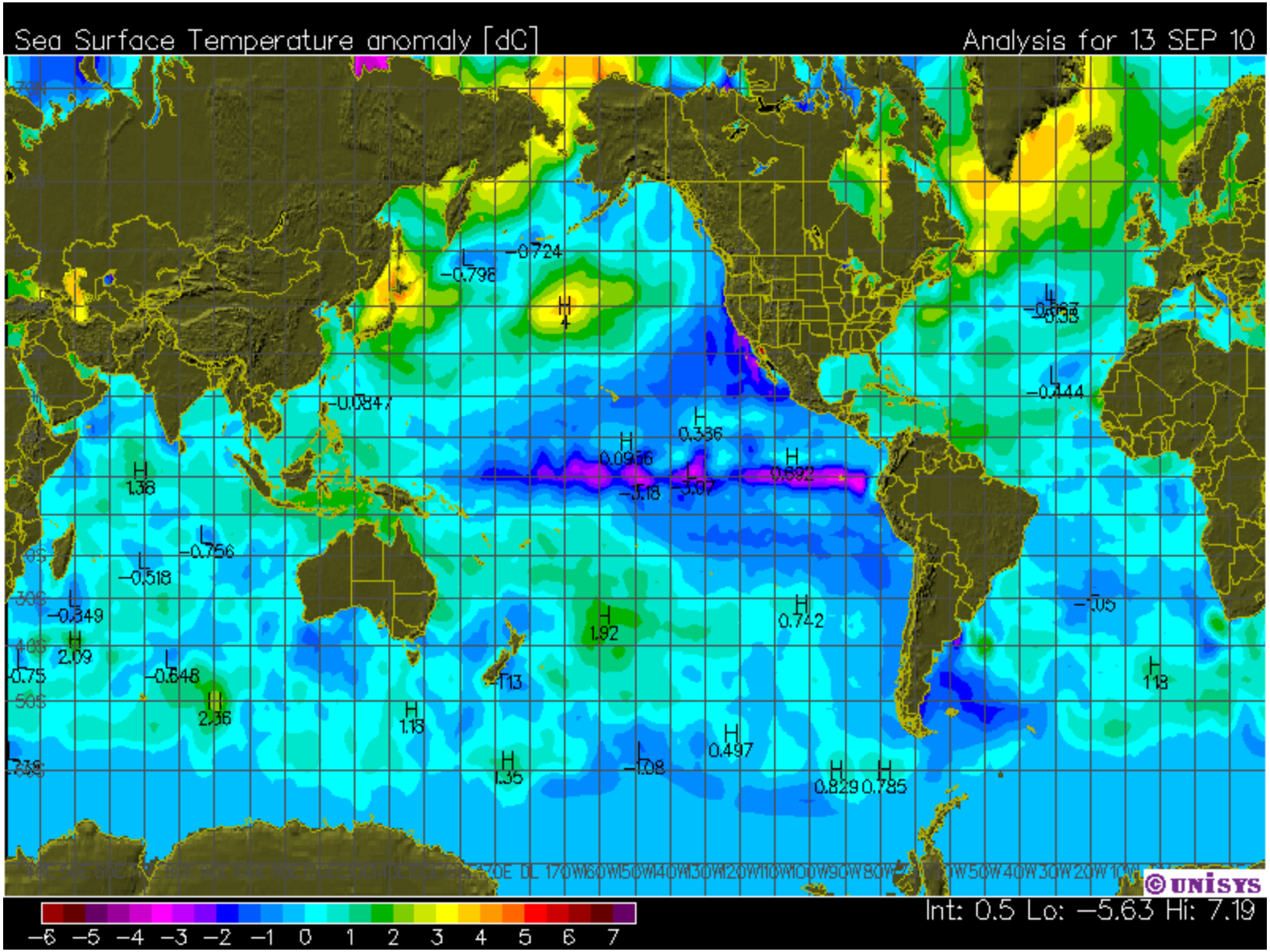
- Mid-Sept Sampling : °Brix ↓ ↓, TA ↑ ↑ ↑, pH —, Berry Weights ↓
- Harvest Composition : °Brix ↓, TA ↑, pH ↓, Yields ↓ ↓

What Caused the Climate of the 2010 Vintage?

Influences on the 2010 Vintage

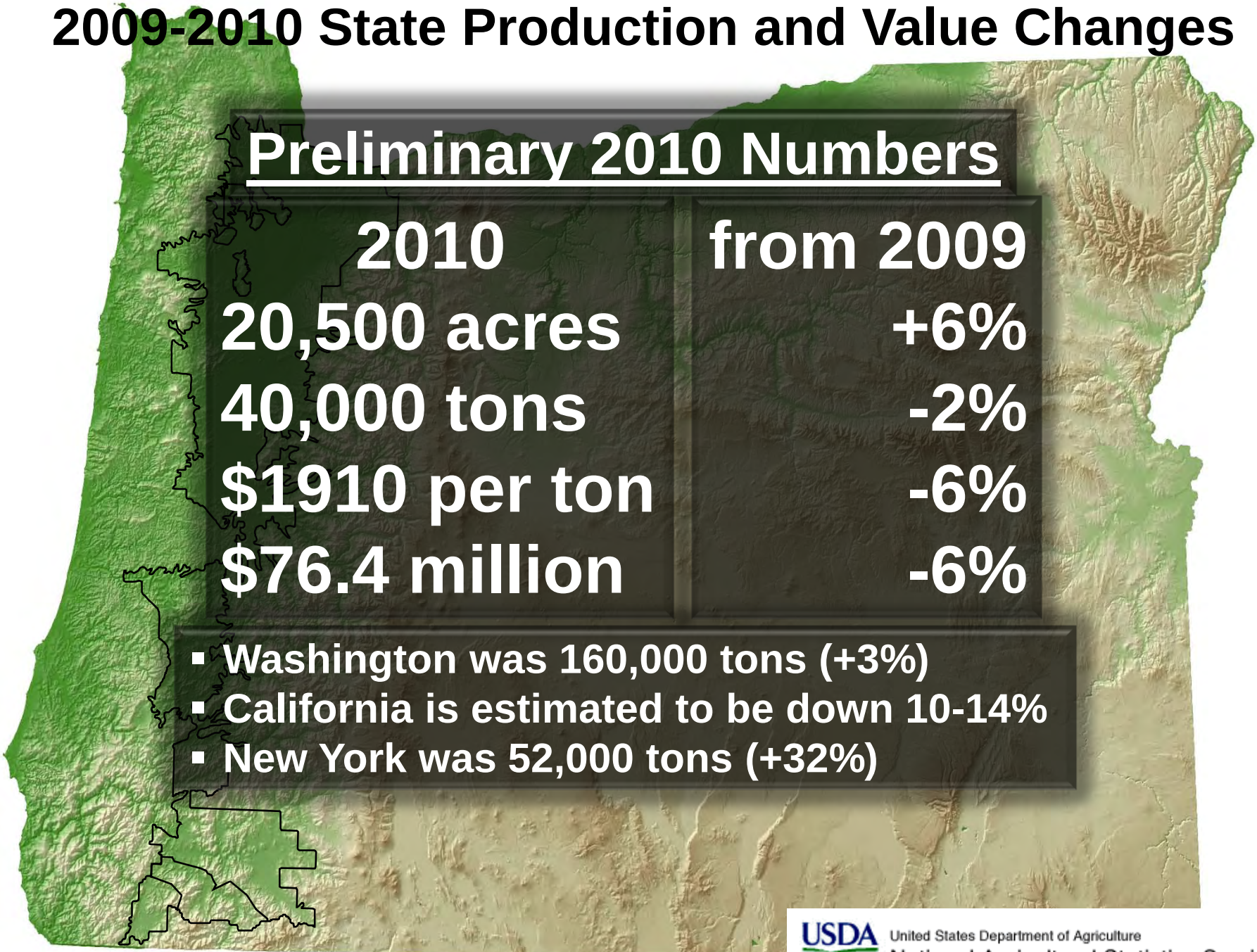
The influences on the overall cool vintage can been seen in how the regional climate variability mechanisms behaved.

1) A dramatic shift in ocean temperatures occurred in late Feb/early March
2) The atmosphere's circulation whiplashed from unseasonably warm to unseasonably cool air flow
3) This happened because of the very cold water along the western US coast (up to 4-8°F cooler than normal) coupled with warmer water out over the North Pacific and the developing La Niña in the tropical Pacific.
4) The cool waters off the west coast moderated temperatures along the western US (making it cooler overall)
5) The warmer than normal water further out in the Pacific brings higher moisture levels over the cooler waters producing a more prolonged marine layer and higher humidity along the coast and inland
6) The warmer than normal water further out in the Pacific induced a stronger than normal trough over the western US during the spring and a weaker high pressure ridge during the summer


Sea Surface Temperature anomaly [dC]
Analysis for 13 SEP 10
-0.724
-0.798
4
-0.0847
0.336
0.0956
0.692
-3.07
1.38
-0.756
-0.518
-0.349
2.09
0.75
-0.648
2.36
1.92
0.742
1.18
1.18
0.497
1.35
-1.08
0.829
0.785
-0.444
-1.05
-1.13
©UNISYS
-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7
Int: 0.5 Lo: -5.63 Hi: 7.19

The Present (or close to it)

2009-2010 State Production and Value Changes



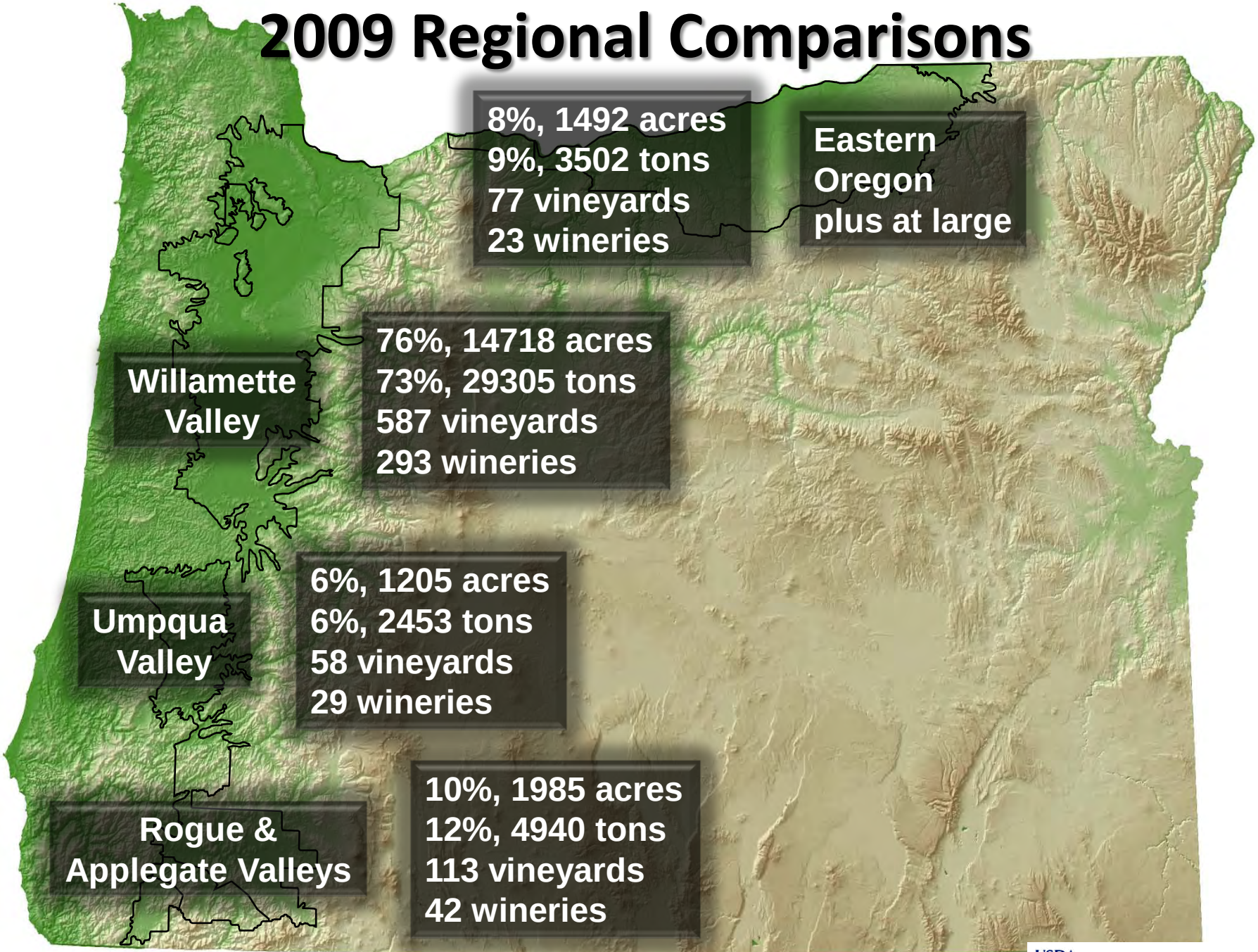
Preliminary 2010 Numbers

2010	from 2009
20,500 acres	+6%
40,000 tons	-2%
$1910 per ton	-6%
$76.4 million	-6%

- Washington was 160,000 tons (+3%)
- California is estimated to be down 10-14%
- New York was 52,000 tons (+32%)

USDA United States Department of Agriculture
National Agricultural Statistics Service

2009 Regional Comparisons



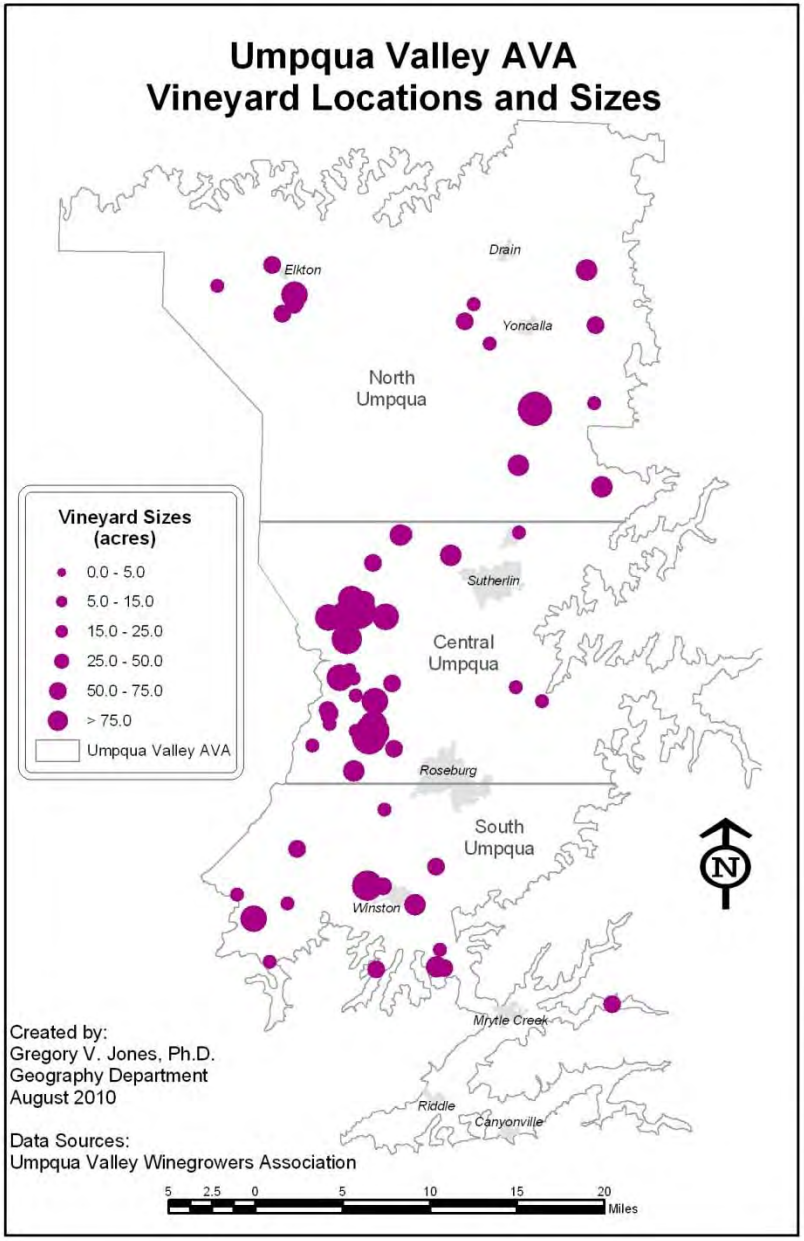
USDA United States Department of Agriculture
National Agricultural Statistics Service

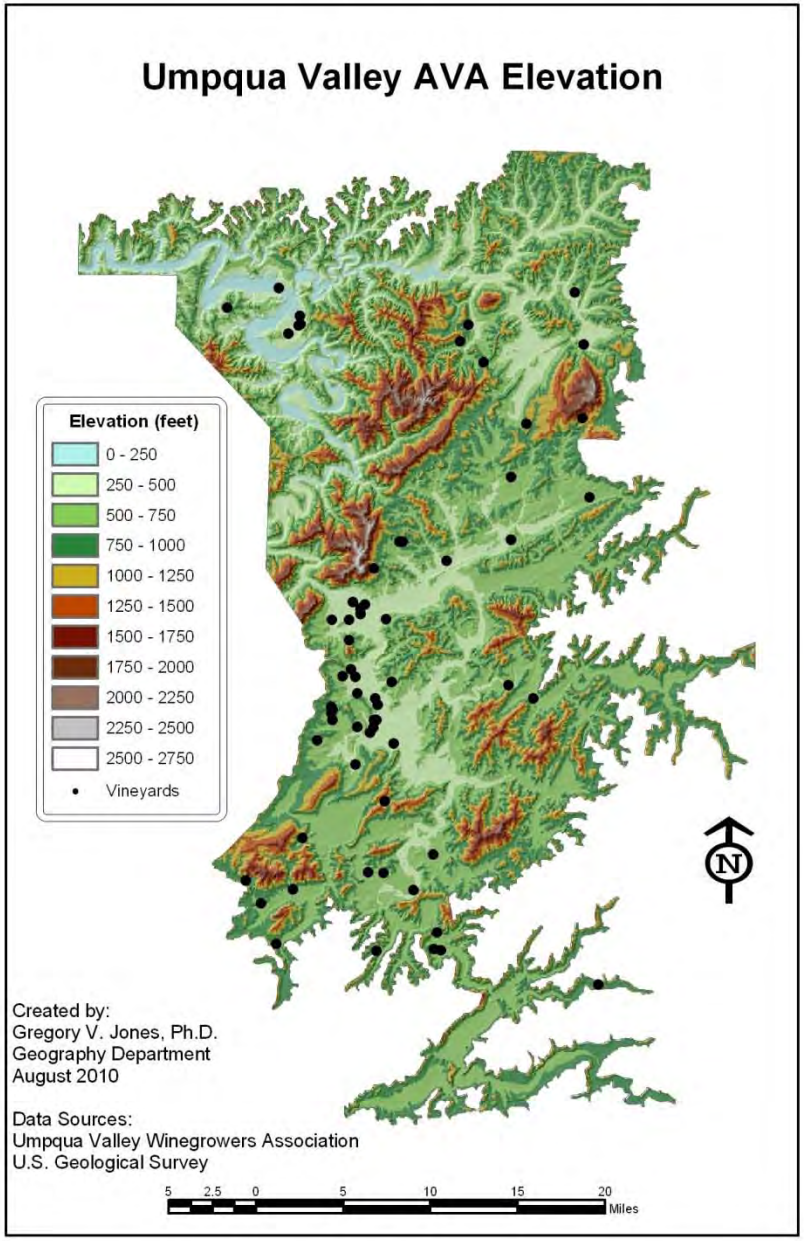
Umpqua Valley AVA Vineyard Changes 2000-2010

Statistic	2002	2010	Change	OASS (2009)
Count	58	64	+6	58
Sum (acres)	1106	1419	+313	1205
Mean (acres)	19.1	22.2	+3.1	
Median (acres)	9.3	10.1	+0.8	
Standard Deviation (acres)	37.1	35.3	-1.8	
Maximum (acres)	205.0	214.3	+9.3	
Minimum (acres)	< 1.0	< 1.0	NA	

Acres	Number of Vineyards 2002	Number of Vineyards 2010	Change
0-5	22	2	-2
5-15	13	20	+7
15-30	17	14	-3
30-60	4	4	0
60+	2	6	+4

Umpqua Valley AVA Vineyard Locations 2010



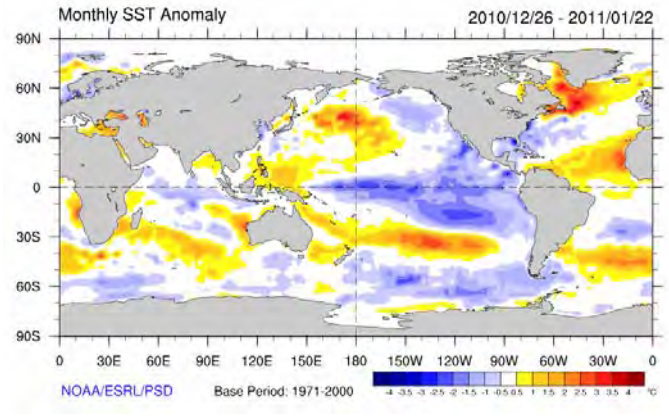


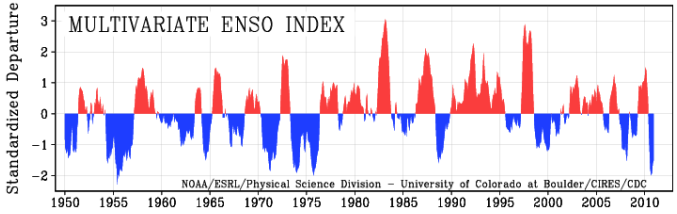
The Future

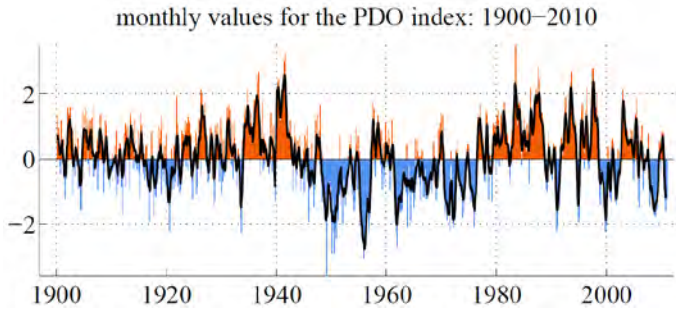
What’s in Store – Vintage 2011

Current and Projected Pacific Ocean/North America Climate Variability Mechanisms

- Moderate-to-Strong La Niña, projected to weaken to "neutral" by JJA
- Strong negative phase of the PDO (cold coastal waters), projected to stay the same through JJA
- These conditions typically affect the climate of Oregon, Washington, and Idaho more dominantly during the Fall through late Spring, but can linger into summer

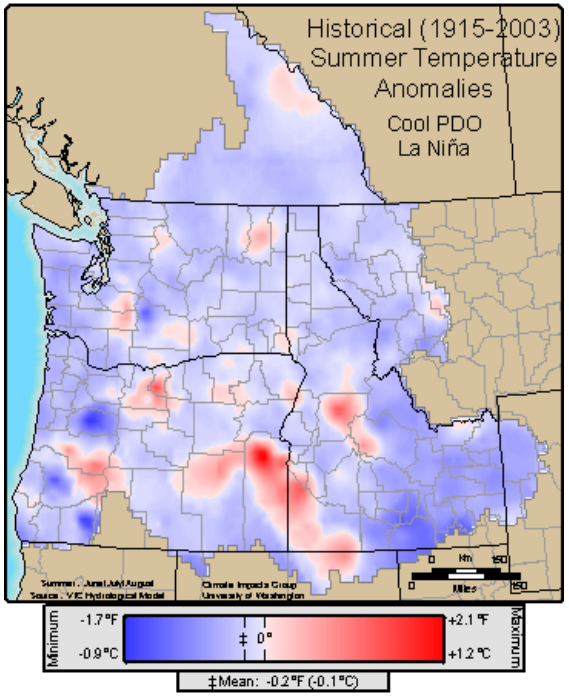


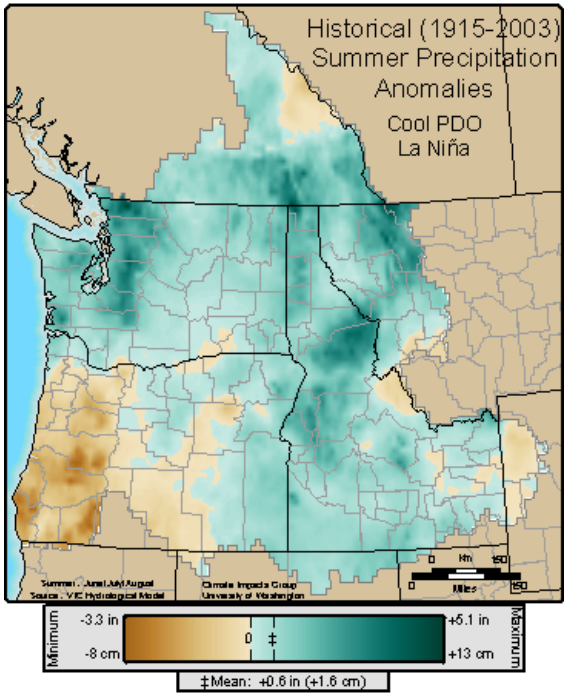




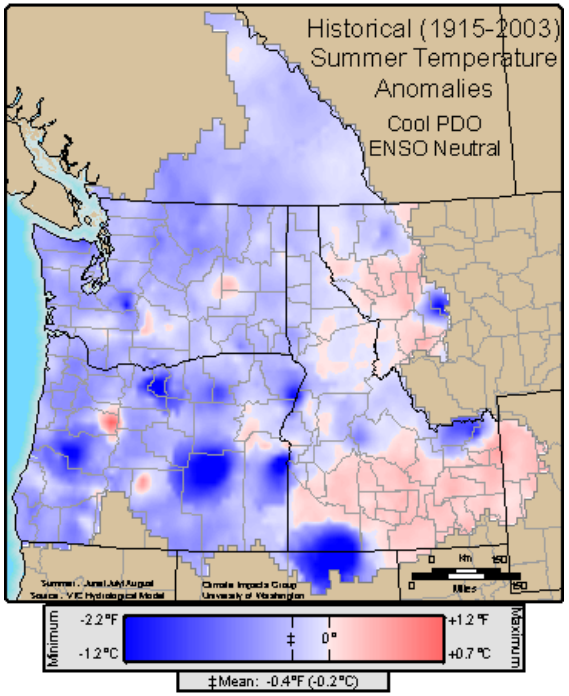
Two Likely Scenarios

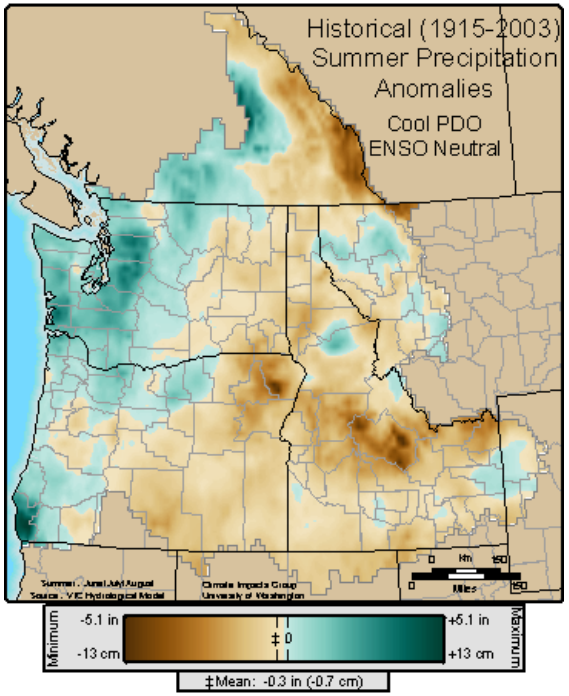
- La Niña and cold PDO conditions, typically bring cooler summers to much of the PNW and mixed wet-dry conditions
- Southern Oregon AVA is typically cooler and drier





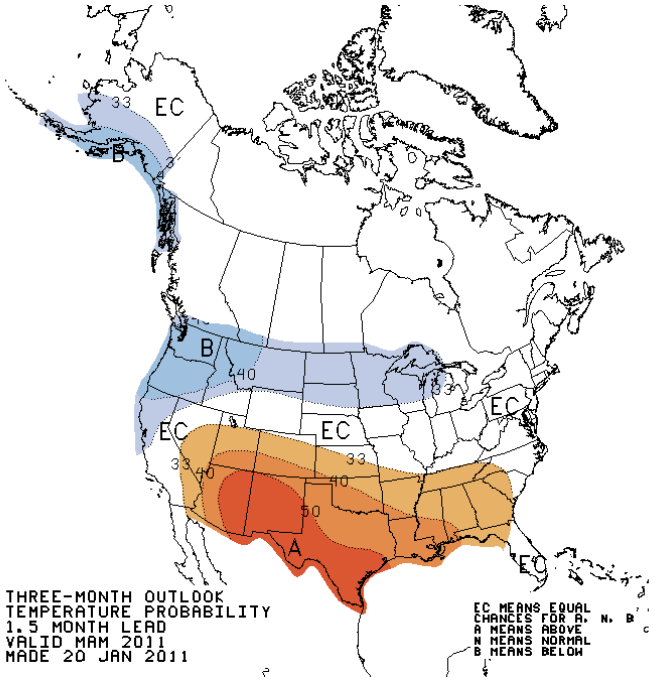
- If neutral ENSO develops, then conditions should still be cooler, but mixed rainfall patterns
- Southern Oregon AVA cooler and mixed rainfall patterns



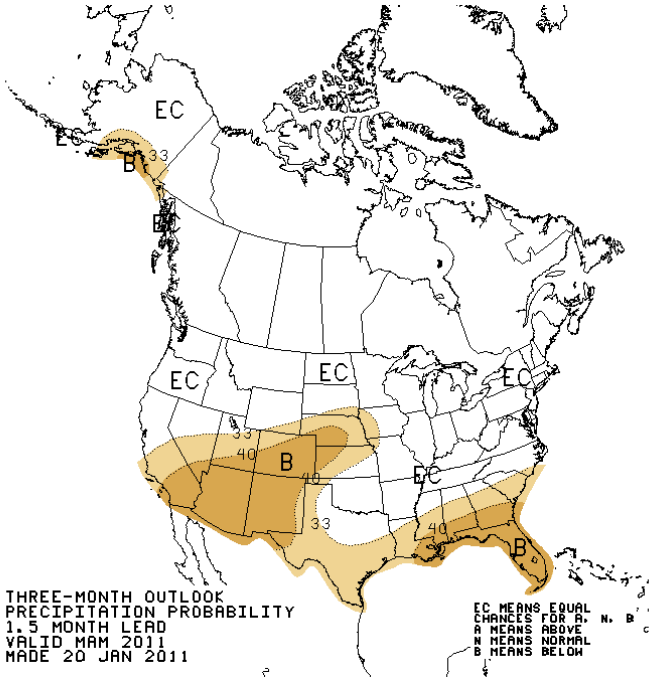


NOAA Forecasts

The March-April-May (MAM) temperature forecast shows that most of the PNW has a greater than 40% chance of having below normal temperatures (similar patterns and probability are seen for AMJ).



The March-April-May (MAM) precipitation forecast is for an equal chance of below-, near-, or above-normal precipitation during this period (similar for AMJ).



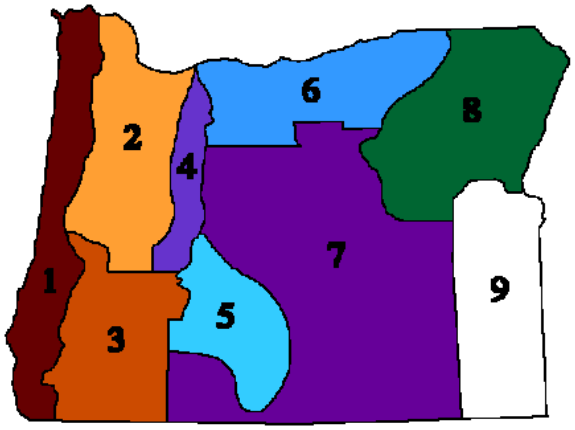
The seasonal forecasts should be interpreted as the tilting of odds towards general categories of conditions, and should not be viewed as a guarantee that the specified conditions will be realized.

Spring/Summer 2011 Forecast

For Oregon in general:

Tropical and North Pacific conditions do not appear to be changing for the better, with cooler conditions likely into spring/summer. All indicators point to a late spring and high variability.

For the Southwestern Valleys of Oregon:



Temperatures

January-March: Below average to average

April-June: Below average to average

Precipitation

January-March: Slightly above to average

April-June: Equal chance of slightly above/slightly below average

NOAA-CIRES Climate Diagnostics Center (www.cdc.noaa.gov)

Oregon Climate Service (www.ocs.orst.edu)

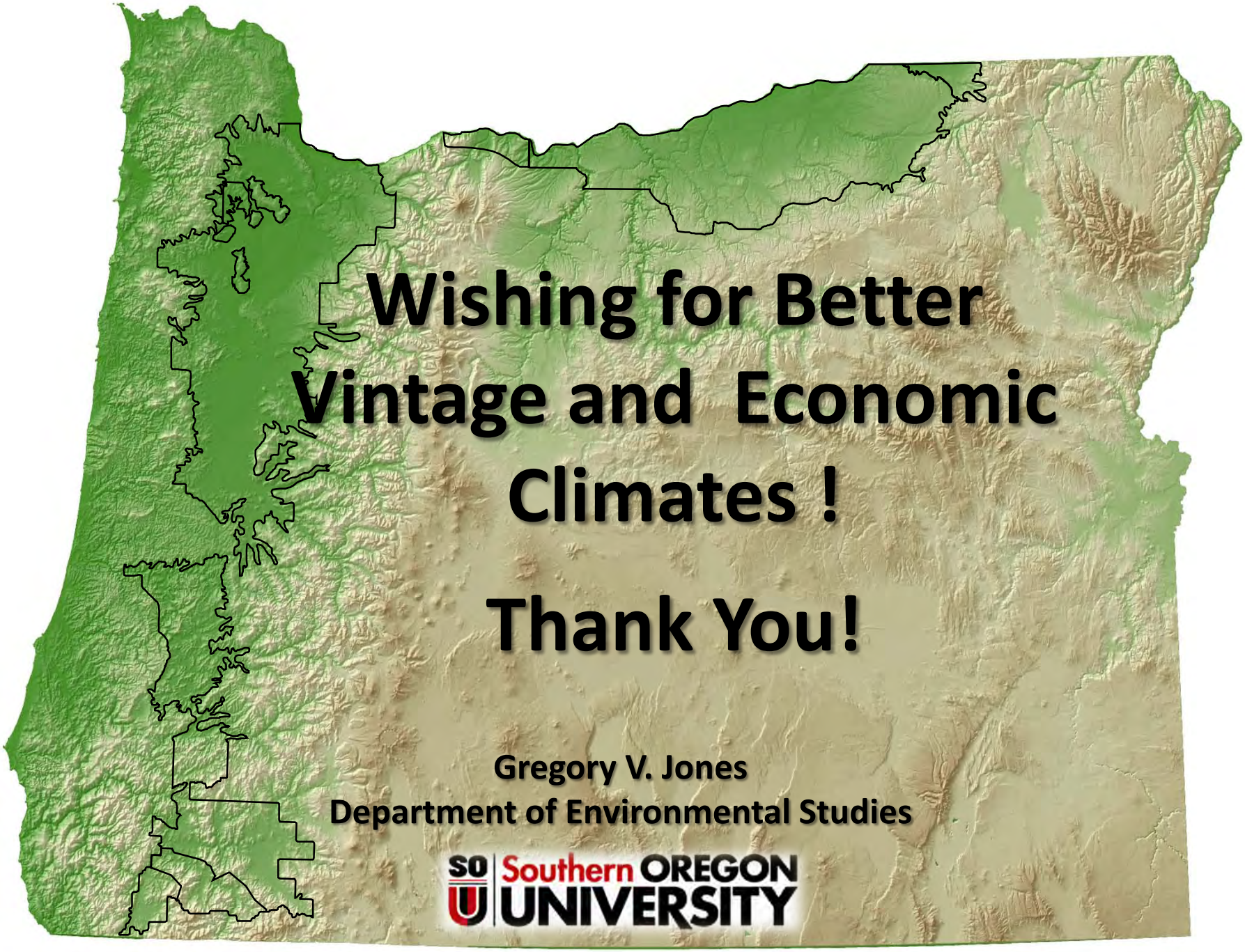
Future

- 2010 was the last vintage for the project … continuation?

Acknowledgements

- The Oregon Wine Board
- The Umpqua Valley Winegrowers Association
- All of the Participating Vineyards
- Chemistry Department at SOU – Steve Petrovic

If you are a member of the UVWA and would like a copy of the report from this year (or 2003 through 2010), send me an email at: gjones@sou.edu



Gregory V. Jones
Department of Environmental Studies
Southern OREGON UNIVERSITY