



NEW STUDIES REVEAL THE DIVERSITY OF THE MARITIME-INFLUENCED LIVERMORE VALLEY

BY JIM GORDON

As a long-time resident of the San Francisco Bay Area, but not a native, a few things about this unique geographical location along Northern California's breezy coast continue to amaze me. The sourdough bread was and is a tangy, chewy treat from the first morning in 1979 when I arrived until today when my 26-year-old son in San Francisco brings us a loaf he just baked in his Sunset District apartment using a sourdough starter that goes back at least 150 years, according to urban legend. Another is the notorious "marine layer" of low clouds or fog that waits offshore during the day and moves inland in the late afternoon, bringing cool sea breezes and often fog the next morning.

A related Bay Area phenomenon that no longer surprises, but still amazes, me is how breezy and ultimately chilly the summer evenings and nights are, no matter whether one lives next to the bay in San Francisco or Oakland or 30 minutes inland in one of the many coastal-region valleys. The cold ocean current that flows south past the Golden Gate spawns both the fog and the virtually year-round evening breezes and chills that make the Bay Area a year-round market for clothing in layers like jackets, sweaters and wraps. A quote well-known to Northern Californians, attributed to the writer Mark Twain, is just as appropriate today as when he supposedly penned it in the 19th century: "The coldest winter I ever saw was a summer I spent in San Francisco." The quote has never been verified, but if he didn't say it he certainly could have.

One of the most memorable times in my adult life when I felt the coldest despite being in above-freezing temperatures, was in the Livermore Valley. The occasion was an evening outdoor concert in the month of September, featuring jazz pianist and singer Diana

Krall. The grape-growing season in this part of the Bay Area was still in full swing and the clusters hanging on so many vines nearby needed more warm weather to fully ripen. I was a Bay Area veteran. I knew it would be cold. I wore two layers of clothing and brought two extra layers, and as Krall transitioned from song to song and the temperature dropped first into the 60s and then into the 50s along with a wind chill factor that deducted several more degrees, I added the extra garments one by one. Still, they weren't up to the

challenge. My toes tapping to the music soon devolved to legs shaking spastically from the cold. My memory has probably enhanced the experience slightly beyond the truth, but the point is that it was cold in the Livermore Valley wine country at 9 p.m. on a day that might have hit 90 degrees Fahrenheit at 3 o'clock.

That dramatic "diurnal shift"—the swing from peak daytime to lowest nighttime temperatures—is as precious to coastal California winemakers as a sourdough bread starter is to its bakers. It's the key that unlocks favorable growing conditions for premium wine grapes along much of the Pacific Coast of the United States. It's a signature of the Mediterranean climate that Livermore Valley vineyards have in common with many in Spain, France, Italy and Greece as well as in the Cape district of South Africa and the coastal valleys of Chile.

Yet something like an urban myth persists about the Livermore Valley. In the grape-growing counties that actually touch the coast, and in Bay Area urban centers, there is—or at least was, in my experience—a general impression that

"... a signature of the Mediterranean climate that Livermore Valley vineyards have in common with many in Spain, France, Italy and Greece as well as in the Cape district of South Africa and the coastal valleys of Chile."



Livermore Valley is hot. Of course, almost any place in California is hot compared to San Francisco. But how hot is it really? And in the realm of wine production—which is the interest of this article—what other facts can help build a complete and accurate picture of this region's suitability for growing high-quality grapes for premium wines?

— What is Livermore Valley's terroir?

My anecdotal evidence hardly disproves all the contrary anecdotal evidence I heard back then or today, but it does raise questions. If there is a public perception or a perception in the greater wine industry about the Livermore Valley that might be misleading, what is the truth?

What data are there on which to base the judgments? What effect does the climate have on grape growing and the quality of wine produced there? What other environmental factors should be examined to better understand wine-growing conditions in Livermore Valley? What roles do the valley's topography and soils play in determining the quality and style of wines from the Livermore Valley American Viticultural Area (AVA)? Do the differences in topography, soils and micro climates within the AVA justify the creation of sub-districts?

To answer these questions in an academically rigorous way based on new research and a re-examination of existing data, the Livermore Valley Winegrowers Association hired two firms with extensive experience in these topics. Patrick Shabram Geographic Consulting of Loveland, Colorado, prepared a 38-page report entitled "Mesoclimate Patterns of the Livermore Valley AVA" that takes an objective look at the variations in climate within the winemaking district based on his analysis of previously recorded numbers from existing weather stations, and includes various maps, graphs and tables. To look more closely at the other major factors affecting grape growing conditions in the AVA, Coastal Viticultural Consultants of Angwin, California, created a 17-page report, "An Overview of Soils, Terrains and Climates in the Livermore Valley American Viticultural Area" that includes extensive maps. Later, a third study was completed by Shabram that takes the ambitious step of subdividing the AVA into districts based on the wealth of information gathered by the previous two reports. A



grant from the California Department of Food and Agriculture to the winegrowers association funded these studies as well as the narrative you're reading now.

The two studies fill gaping holes in what's known about the valley's unique conditions for viticulture. They don't turn the general assumptions of local winemakers and growers upside down exactly, but do add thousands of data points and dozens of new insights, including a much better picture of how hot and how cold the AVA is.

As the association's executive director, Chris Chandler, notes, "For years, growers and vintners have anecdotally talked about the differences between the far western side of the AVA and the eastern side, the differences between the valley floor and the hillsides, the variation in soils and the differences from one vineyard to another. We've needed to get beyond anecdotes and general observations, which is where the soils and climate reports come in. We didn't know exactly what the research would yield when you overlay the climate data on top of the soils and slopes information. It turns out that there are 12 identifiable districts."

— 160 Years of Wine-Growing

The vineyard and winery professionals working in the AVA are continuing a well-documented tradition of grape-growing innovation and quality-oriented winemaking that dates back more than 160 years. They know from six generations of experience that the lay of the land, the warm sunshine during the growing season and the almost daily cooling influence of breezes from the San Francisco Bay create excellent conditions for wine grapes. That's because the land has varied sites that are flat, sloping or hilly, the soils are moderately fertile and well-drained and the climate is warm enough for good ripening of the grapes while cooling off enough each night and morning for the grapes to retain their natural acidity even during a long growing season. Good natural acidity lends a balanced, appetizing taste and texture to wine, and is possibly the one biggest differentiator between average-quality wines grown in a truly hot climate and potentially excellent wines grown in a moderate climate. Before we go further into the climate, soil and topography, however, let's learn more about the previous generations and some of their experiences.

Robert Livermore, a winemaking pioneer and the valley's namesake, was the first significant Anglo-European property owner. In 1846 he planted grapes and later harvested and fermented them, discovering that they grew well and made decent-quality wine. Historian and author Gary Drummond wrote in 1999, on the occasion of the 150th



anniversary of Robert Livermore's first harvest, "We know he planted the Mission grape and likely used the same methods employed by the Spanish padres for making wine..." Mission San Jose, an outpost of the Catholic Church about 30 miles away, had planted grapes in 1797 and by the 1830s was making more than 1,000 gallons of wine annually, according to Drummond.

Commercial winemaking in the area didn't gain much traction

until the 1880s, when in a few years the Livermore Valley transformed itself into one of the most forward-thinking, trend-setting regions in California based on business savvy and a few well-traveled, well-educated leaders. Foremost among these was Charles Wetmore. Drummond writes that Wetmore conducted a study

of the California wine regions for the Alta California newspaper (where the aforementioned Mark Twain had also been a correspondent). Wetmore found a struggling business, plagued by low prices and poor wine quality. He then traveled to French vineyard regions, gathered ideas about soil conditions, grape varieties and winemaking methods, and returned to California full of "an infectious enthusiasm," convinced that European viticulture practices should be applied here, Drummond noted.

In 1882 Wetmore established Cresta Blanca vineyard in Livermore Valley, a move that was supported by other vineyard plantings large and small that brought the total acreage of grapes under cultivation to 2,800 in 1885. Why Wetmore chose Livermore Valley may be explained by a passage in his 1882-83 Report to the State Viticulture Commission that compares the part of Burgundy that includes the then- and now-famous vineyards of Pommard, Volnay, Chambertin and others to Livermore Valley. Wetmore wrote, "Some similarity in appearance and geological formation may be traced between the hills and slopes about the mouth of the Arroyo del Valle, near Livermore Valley, in this State, and those of the Cote d'Or." Wetmore's vines at

Cresta Blanca matured. He returned to France in 1889, bringing bottles of his 1886 vintage to the Paris International Exposition to compete against some 17,000 other entries. Judges awarded the Grand Prix to his Cresta Blanca Livermore Valley Sauterne. Drummond calls this the "incomparable prize"; it must have been the equivalent of a Best in Show given today in wine competitions. Two other Livermore Valley winemakers and one from Napa Valley also won gold medals. This judgment in Paris must have been at least as important in its day as

the 1976 "Judgment of Paris" in which Napa Valley wines were preferred over great wines of Burgundy and Bordeaux in a blind tasting by French judges.

Two of the biggest names today in Livermore Valley wine – Wente and Concannon – also got their starts in the 1880s, and were instrumental in the

following decades for introducing grape varieties and new viticulture and winemaking practices that spread not just in Livermore Valley but up and down the state of California. Carl Heinrich Wente, already an experienced winemaker, took over an existing Livermore Valley vineyard in 1883 and soon expanded to 57 acres. Five generations later Wente Vineyards has the largest vineyard holdings in the Livermore Valley AVA, and makes the largest quantity of Livermore Valley-grown wine. Chardonnay has long been Wente's signature varietal. In fact, well over half of the state's 100,000 Chardonnay acres are planted with vines descended from those introduced to the Wente family's property in 1912. These vine selections include Clone 4, Clone 2A and other so-called "Wente clones" that trace their lineage here. In 1936 Wente broke new ground by putting "Chardonnay" on its labels, a marketing move that ultimately culminated in Chardonnay becoming California's best-selling varietal wine today.

In a similar vein, Concannon Vineyard was an early arrival and responsible for multiple innovations that changed the California wine industry. James Concannon bought a vineyard property of 47 acres in

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1883, and by 1895 his winery held 175,000 gallons of wine. To begin with the finest vines in the world, Concannon traveled to Bordeaux. There, with the help of Charles Wetmore, he acquired Sauvignon Blanc, Semillon and other varietal cuttings from the already legendary Sauternes estate of Chateau d'Yquem and his Cabernet Sauvignon and other red Bordeaux varieties from Chateau Margaux to propagate his vineyard, according to accounts by Concannon family members. The family business later became influential as a pioneer of Cabernet Sauvignon and Petite Sirah, too. The "Concannon Clones" 7, 8 and 11 of Cabernet Sauvignon came from Concannon in 1965, and the winery estimates that 80% of the 90,000 acres of Cabernet Sauvignon vines growing in California derive from those clones. Also, in 1961 Concannon was the first winery to print "Petite Sirah" on its label.

State records show that vineyards in Livermore Valley reached 4,466 acres in 121 sites in 1893 and 23 of the properties made wine on site. But the root louse phylloxera began killing Livermore Valley grapevines in the early 1890's as part of a pandemic that ultimately destroyed a majority of *Vitis vinifera* wine-grape vineyards in Europe and the United States. An even more devastating disaster overwhelmed the U.S. wine industry when a Constitutional amendment put Prohibition into effect in 1920, virtually eliminating the sale of wine and removing the demand that kept grape farming viable. Most wineries closed and many vineyard owners either abandoned their vines or converted the land to other crops. Concannon and Wentz kept a minimal wine business going to supply sacramental wines to churches. When the repeal of Prohibition took effect in 1933 vineyards had shrunk to 2,500 acres. The trend continued into the 1950s, when grape acreage bottomed out at 1,100. It took decades for winemaking in Livermore Valley and most of California to become a vital, growing business again.

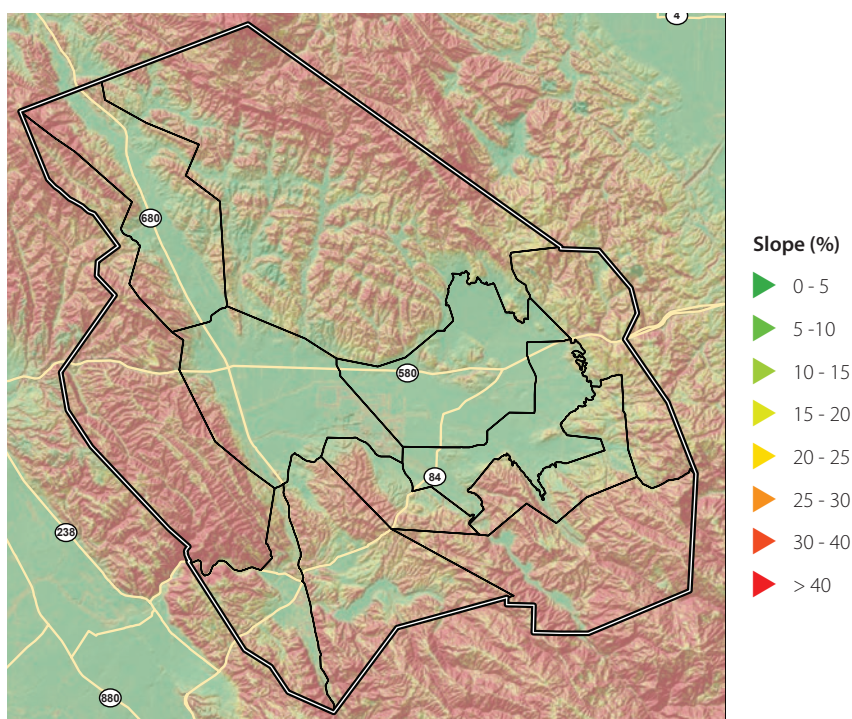
In the 1970s new wineries finally began popping up in places like Napa and Sonoma, and consumers took a renewed interest in California wine due to the aforementioned Judgment of Paris and enthusiastic promotion by vintners like Robert Mondavi. But wineries in the San Francisco Bay Area had a new scourge to deal with: the pressure of urban sprawl. It made land more valuable as sites for homes and businesses than as agricultural property. Livermore Valley was in easy commuting distance from San Jose and Silicon Valley and had its own big employer, Lawrence Livermore National Laboratory, whose well-paid civil servants wanted to live in expansive suburban homes close to where they worked. Housing developments pushed right up against established vineyards in and around the city of Livermore and swallowed some of them.

In the early 1980s local growers and winery owners founded the Livermore Valley Winegrowers Association

to promote and protect the valley's vineyard land. One of the association's first goals was to apply for AVA status for Livermore Valley, which it achieved in 1982 and amended in 2006. The association's effort to prevent housing development from over-running vineyards culminated in 1993 when the Alameda County Board of Supervisors adopted the South Livermore Valley Area Plan that encouraged vineyard development with economic incentives and conserved vineyard land with easements and land trust arrangements. LVWA members today believe that the plan reassured the existing growers and vintners, and by showing a clear path for more wine-growing development, laid the groundwork for a 25-year revival that has resulted in vineyards that now cover 4,000 acres, and in wineries that now number 50-plus.

Mapping topography and soils

The Livermore Valley AVA is a large and diverse region of 259,000 acres or 405 square miles, encompassing four geographic valleys surrounded by hilly and mountainous terrain that reaches its highest point at the peak of 3,848-foot Mount Diablo at the far northern point of the AVA. Within its borders are seven cities, two large reservoirs and a population of 325,000 people. Two interstate highways cut it very roughly into quarters, with I-680 running north and south, and I-580 running east and west. The AVA stretches from Alameda County in the southeast to Contra Costa County in the northwest, nestled between ridges of the coastal mountains that separate the San Francisco Bay from the interior of California. The AVA is landlocked but its western border is only eight miles from the bay. Prevailing western winds and some unique topographic features that work like cooling ducts connect with the bay and give the AVA a daily maritime influence.



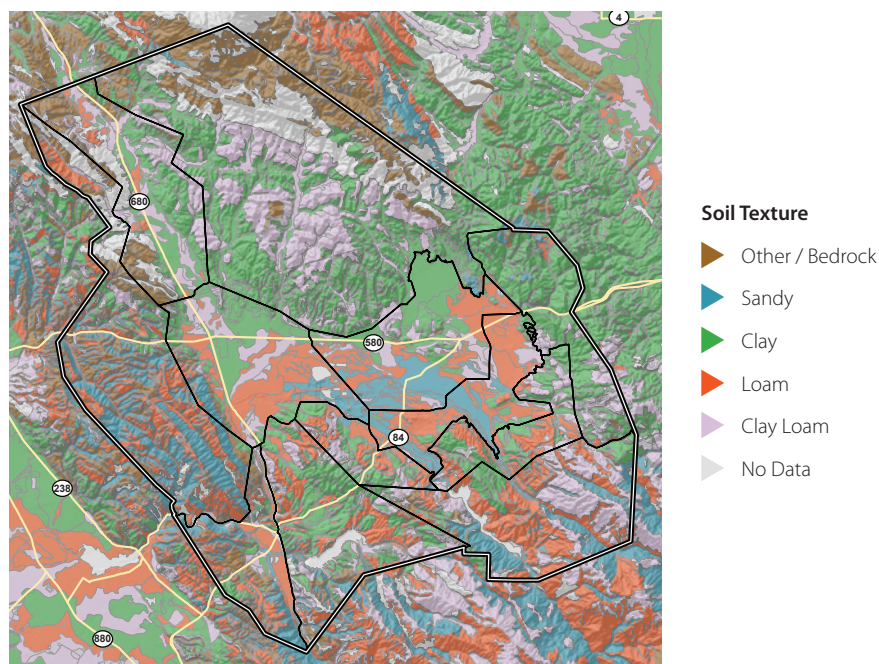
The study of soils, terrains and climates by Coastal Viticultural Consultants aims specifically at identifying the predominant aspects of the AVA that are relevant to viticulture, including: climate zones, slopes, soil characteristics, soil orders and soil series. Authors Bryan Rahn and Michael Princeville begin by stating, “The Livermore Valley AVA has, in general, a Mediterranean climate. Soils in the area vary greatly and generally range from gravelly sands to clay loams and clays. Terrain within the AVA commonly varies from mostly flat or gentle to moderately sloping (less than 20 percent) to hillsides with 40+ percent slopes.” They say the terrain consists of about equal parts of land under and over 20 percent slope and a wide range of exposures in all directions of the compass, especially in the more mountainous sections. The range of exposures gives options to growers based on the grape varieties they grow. For instance, vineyards with southern exposure tend to warm earlier in the spring and experience bud break early, which can be a negative if the location has frost risk, but positive if it doesn’t. Eastern-facing would be better to ward off damage from spring frosts as vineyards with this exposure warm first from the morning sun.

A thorough description of the soils and terrains begins with the parent materials that underlie the earth’s surface in the AVA. They range from alluvium to sandstone and mudstone. Many existing Livermore Valley vineyards are planted in generally flat terrain where the parent material is alluvial, formed by erosion and shaped by water. Sandstone becomes more prevalent in higher elevations, while mudstone is found in rugged terrain on the western and northern extremes of the AVA where few vineyards currently exist.

Going one step more specific, the AVA was found to have six predominant soil orders out of the 12 soil orders recognized by the U.S. Department of Agriculture for their differences in textures, chemistry, colors and how they were formed. “The number and diversity of these soil orders indicate a diversity of soils in the AVA,” the authors write. They note that the entire AVA appears to clear two potential hurdles for wine-grape growing: soil pH and soluble salts are both in good ranges. The pH readings fall within the good-for-viticulture range of 5.5 (relatively acidic) and 8.5 (relatively alkaline). Water-soluble salts are measured by electrical conductivity of the soil, and the measurements showed healthy, low levels of soluble salts everywhere the authors looked in Livermore Valley.

Next the study examined soil texture and a directly linked attribute: water-holding potential of the soil. The prevailing wisdom is that high-quality wines are easier to make from soil that holds some rain water or drip irrigation water but not too much. That’s why grape

growers around the world are proud to show off the pebbles, rocks and even boulders that dominate the soil of their vineyards, because gravel and sand by themselves do not retain water for long. That requires other elements in the soil such as organic matter, silt and clay. They boast that their vineyards are well-drained and under no threat of producing over-vigorous vines. Vines with wet roots are great at producing long shoots and a plethora of leaves that require lots of labor intensive training and trimming but they’re not so great at forming the small, flavor-intense bunches and berries that winemakers prefer. It’s interesting to note how many wine properties internationally are proudly named for rocks, including Chateau Ducru Beaucaillou in Bordeaux (caillou = pebble in French), Diamond Creek Winery’s Gravelly Meadow vineyard in Napa Valley, Darcie Kent Vineyards Stone Patch Cabernet Franc from Livermore Valley, and a relatively new AVA in Washington State, The Rocks District, to name a few.



Rocks galore fill certain Livermore Valley vineyards, but soil textures in the AVA include mainly sands, silts and clays, and mixtures of sands, silts and clays. Soil textures affect grapevine rootstock selection, water-holding capacity, irrigation design, fertilizing strategies and erosion control measures. The study found that the soil textures in the portions north of I-580 consist mainly of clay loams and clays that inherently have higher water-holding capacity than the sandy and loamy soils of the southern portion. The AVA’s significant variations in soil textures can give winemakers more options, offering more opportunities for diversity and flexibility in viticultural decisions.

Sifting the soil analysis finer, the study reveals a wide diversity of soil series in the AVA. “A soil series is a means of defining and naming a spatial area of soil with characteristics that are (mostly) unique and or different from other groups of soils,” the study’s authors explain.

The study includes helpful maps that display the various soil series as recorded by the U.S. Natural Resources Conservation Service of the USDA. The predominant soils in the northern part of the AVA are Clear Lake soil series, Fontana-Diablo-Altamont soil series complex, and the tongue-twisting Millsholm-Los Osos-Los Gatos-Lodo soil series complex. The southern portion of the AVA includes the three units just noted, plus four other soil map units: the Positas soil series, the San Ysidro-Rincon soils series, the Vallecitos-Parrish-Los Gatos-Gaviota soil series, and the Yolo-Tehama-Pleasanton-Mocho soil series.

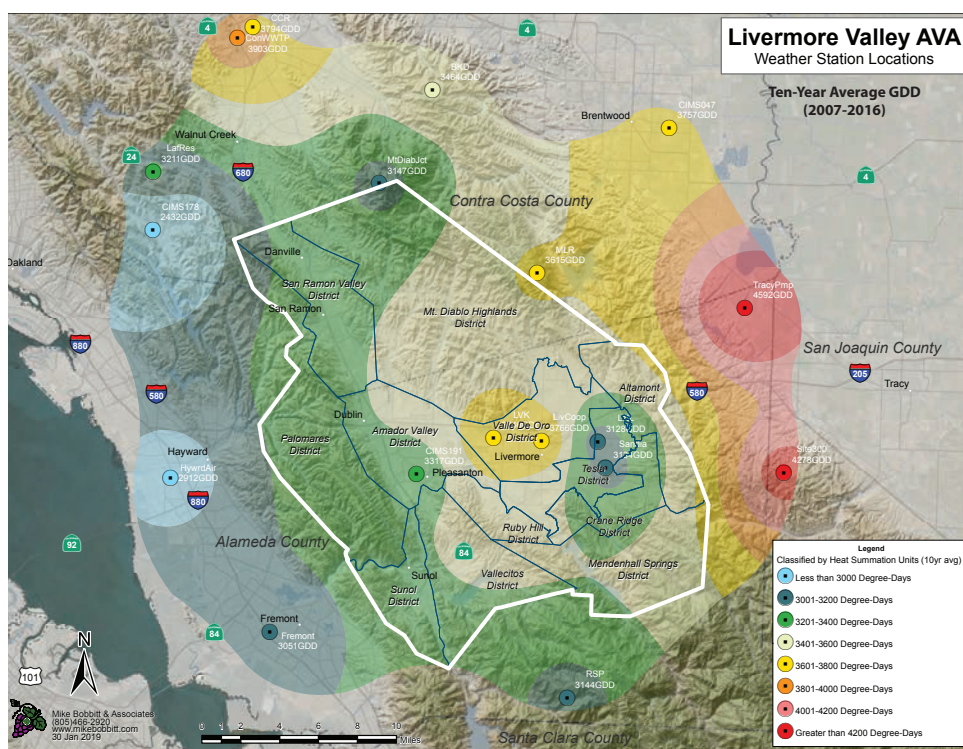
Many of the soil series were named for locations elsewhere in California where they were presumably first classified—Clear Lake, Yolo, San Ysidro for example—but others are native to the Livermore Valley AVA, like Positas and Pleasanton, which also happen to be among the soils in which a large portion of the current vineyards are planted. Rancho Las Positas was the name that pioneer Robert Livermore gave to the land grant he received from the Mexican government around 1840, and Las Positas today is the name of a boutique Livermore Valley winery. Positas has alluvium parent materials and “consists of sandy loam, fine sandy loam, silt loam, loam or clay loam textures and can have up to 35 percent pebbles, gravel or cobblestones ... in the upper soil strata,” the study details. Pleasanton soils show gravelly and fine sandy loam textures in the upper strata and have gravel or cobbles in the mid-strata. Pleasanton also has alluvium parent materials.

A deep dive into climate

Now to return to the conundrum of a supposedly hot region having bone-chilling summer nights, let’s look closely at what Patrick Shabram found in his 2017 study, “Mesoclimate Patterns of the Livermore Valley AVA.” He was commissioned to do a deep dive into the “meso” or mid-level climate patterns, those that fall between the average AVA climate and the micro-climates of specific vineyard sites, analyzing data from 41 existing weather stations in and around the AVA and doing on-site observations of his own. As a geographic consultant, Shabram has previously studied many viticultural areas in California, notably in the Sonoma County districts of Russian River Valley and Alexander Valley, as well as grape-growing districts in Santa Barbara and Contra Costa counties, among others. His report introduces the challenge of describing Livermore Valley’s mesoclimate patterns better than I can:

“Despite its inland location, the Livermore Valley AVA experiences the cooling effects of coastal air flow, moderating temperatures compared to the hotter inland locations of the San Joaquin Valley to the east,” he writes. “In general, the Livermore Valley AVA is positioned farther from the Pacific Coast than many Central Coast or North Coast viticultural areas and is not adjacent to inland bays. Nevertheless, a series of wind gaps allow cooler air to penetrate the Livermore Valley AVA, an influence that wanes in certain sections of the AVA.

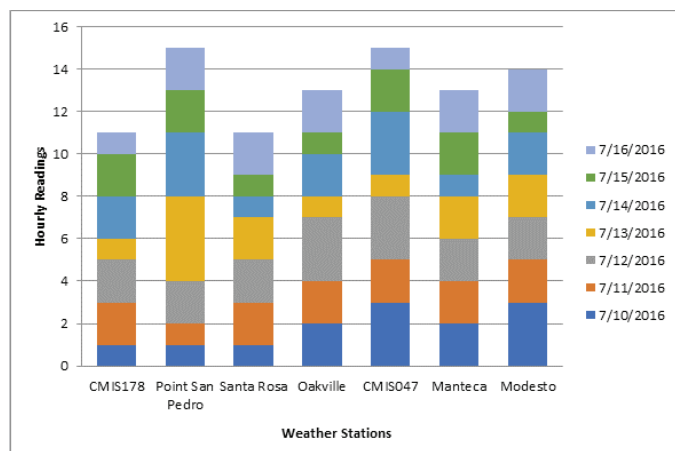
“In general, the Livermore Valley AVA has been described as a transitional area between cooler climate regions to the west and warmer locations further inland, with temperatures warmer and drier as one moves from west to east through the AVA. Local growers, however, suggest that climatic shifts are much more complex than this generalization would suggest, perpetuated by a combination of varied topography, airflow, and urban influences.”



Shabram used the Winkler Scale of Growing Degree Days to plot how warm or cool the growing season was at each station, since this is the most widely accepted method in viticulture. He put a much finer point on it, however, than the scale’s creators, professors Maynard Amerine and Albert Winkler of the University of California, were able to do when they first created the scale in the 1940s and used it to label climatic regions from the coolest, Region I, through the warmest, Region V. Growing degrees are calculated by taking the midpoint between the high and low temperatures in degrees Fahrenheit and subtracting a base level of 50 degrees. Adding all of these up for the growing season of April 1 through October 31 in California results in a

heat summation stated in “growing degree days.” The original Winkler scale used monthly average temperatures for the calculations—since very few weather stations existed and not all of those recorded daily temperatures—while exacting scientists like Shabram today can use daily temperatures.

The Livermore Valley was tagged decades ago as Region III to IV with 3,000-4,000 growing degree days, and this meant, according to the conventional description for Region IV that, “Red wine grape varieties can be planted; however, quality may not be optimal depending upon the varietal. Hotter climate or longer season varieties like Mourvedre and Tempranillo may be better suited for these areas.” Shabram’s analysis, however, showed a range of 10-year growing degree day averages within the Livermore Valley AVA from 3,128 degree days at the Lawrence Livermore Valley National Laboratory meteorological tower to 3,766 degree days in the central part of the city of Livermore Valley. Four of the six stations in the AVA gave 10-year averages that make the Livermore Valley a Region III, not IV. The Winkler scale verbiage for Region III is: “suitable for high-quality red wine varieties like Merlot, Cabernet Sauvignon.” Well-known Region III locations of the world include Sonoma Valley, Friuli in Northern Italy and Margaret River in Australia, while some well-known Region IV locations are the southern Rhone Valley of France, northwestern parts of Napa Valley, and the Barossa Valley of Australia.



Graph 2 – Combined number of hourly readings at high temperature (based on temperatures within 0.5°F) for Pleasanton and representative CIMIS stations

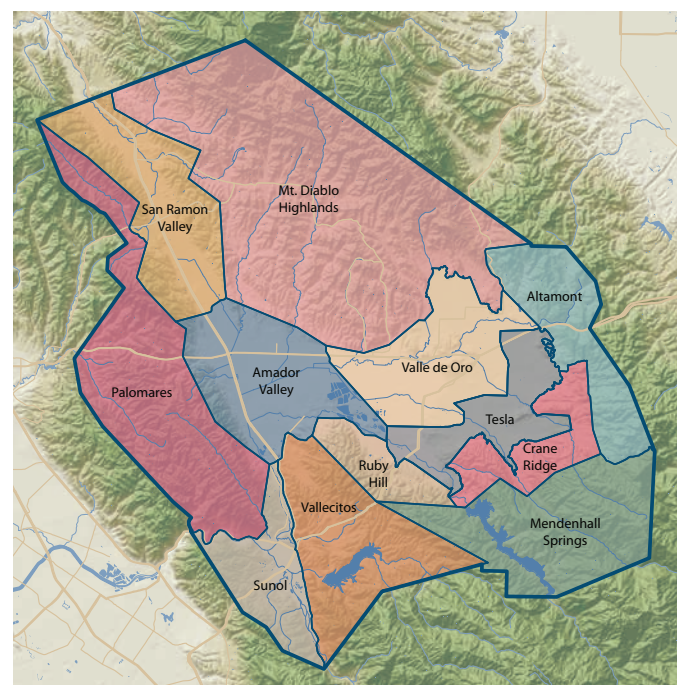
The Winkler scale is useful, but far from perfect, as Shabram explained: “If the methodologies are consistent, then usually you can get an idea that one area might be warmer or cooler than another area. The problem is that most people in the industry are less concerned about the growing degree days number, which varies from year to year, and are more concerned about the region (i.e., Region I-V), but these regions were based on the most antiquated methodologies.”

One big factor that the methodology still misses in many cases, is a consideration of how long the high or low daily temperatures last.

Shabram said, “So if on any given day the temperature reaches 90°F for half an hour before coastal fog rolls in and cools down an area, and the low temperature was 60°F, then the average would be 75°F even if more of the day has had temperatures closer to the low temperature than to the high temperature. Such scenarios seem to be the norm in the Livermore Valley AVA.”

Widely acclaimed wines from Napa, Chateauf-neuf-du-Pape and Barossa made from Cabernet Sauvignon, Grenache and Syrah prove that the Winkler region IV grape variety recommendations are no longer authoritative, and Shabram’s study proves that it’s much too simplistic to label the Livermore Valley as strictly a hot region. However, going a few miles east of the AVA, over a mountain pass and descending to the city of Tracy in the San Joaquin Valley, the climate does change quickly. Tracy has a 10-year average of 4,600 degree days or Region V, considered by many unsuitable for high-quality wine grapes. But the hottest spot within the Livermore Valley AVA in the 10-year averages was less than 3,800 degree days.

12 districts based on data



Armed with the very specific, very extensive, very current temperature, precipitation and wind-speed data from the climate study, and with the wealth of topography and soils research discussed earlier, Patrick Shabram was then able to conduct a follow-up study on the Livermore Valley AVA that expanded on the first two. Its goal was to slice and dice all the data, and then re-group it as it related to individual parts of this complex and widespread grape-growing region. The first two studies had shown such diversity in soils, slopes, exposures, elevations and mesoclimates, that the Livermore Valley Winegrowers Association

wanted to know if it was possible to identify districts inside the AVA that were fairly consistent in these multiple factors within themselves, but quantifiably distinct from other parts of the AVA. Supported again by the grant from the California Department of Food and Agriculture, Shabram created a paper, "The Viticultural Districts of the Livermore Valley AVA," that outlines 12 such grape-growing neighborhoods averaging 22,000 acres in size.

He started with the Tesla district, being the area just south and east of the city of Livermore through which Tesla Road (named for electrical engineering pioneer Nikola Tesla decades before Elon Musk created his car company) runs, and where the most commercial viticulture activity is centered. The area includes the floor of the southern Livermore Valley and some low, rolling hills. Elevations are generally under 700 feet, the soils are mostly alluvial and the climate is cooler than farther north in the AVA. Shabram writes that the coolness is "a result of cool Pacific air flowing in through the Vallecitos pass and air drainage off higher elevations mixing with other airflow onto the Livermore Valley." Shabram describes in his climate study how the AVA as a whole has multiple airflow patterns. The most direct source of cool maritime air is over the Dublin Grade on the western side, while air flowing over the Sunol Grade farther south either moves into the Amador Valley and then into Livermore Valley or into the Vallecitos Valley first and then into southern Livermore Valley.

The Tesla district, home to the wineries of Concannon, Wente, Murrieta's Well and at least a dozen others, has traditionally been labeled as a Region III (3,000-3,500 growing degree days) but Cabernet Sauvignon, a late-ripening variety that benefits from heat, is among the most common varieties planted here. Shabram's analysis suggests

that the Tesla district is on average in the lower half of Region III. Soils are silty to sandy loams that are deep and well drained.

Two of the other newly identified grape-growing districts, Ruby Hill and Crane Ridge, also have current commercial viticulture activity. Ruby Hill sits just to

the southwest of Tesla above the valley floor at elevations generally stretching from 700 to 1,000 feet, a position that reduces frost risk but is still in the path of cooling Pacific airflow through the Vallecitos pass. The district takes its name from Ruby Hill Winery, built here in 1887, and also is home to several other current wineries and vineyards. The Crane Ridge district occupies a narrow band to the southeast of Tesla and above the valley floor where the soil parent material is mostly sandstone. Described as similar in elevation and soil to Ruby Hill, Crane Ridge has more west-facing slopes, which are generally greater than 5 percent but can range from 10 to 20 percent. Shabram observes that Tesla, Ruby Hill and Crane Ridge all have later harvest times than other growing regions with similar growing degree days, according to veteran Livermore Valley growers.

"The AVA's significant variations in soil textures can give winemakers more options, offering more opportunities for diversity and flexibility in viticultural decisions."



The other nine districts continue in a roughly clockwise direction around these three. They are named Altamont, Mendenhall Springs, Vallecitos, Sunol, Palomares, San Ramon Valley, Mt. Diablo Highland, Valle de Oro and Amador Valley. The districts are defined by a combination of climate, soil, geology and slope, with no attention to existing vineyards. Shabram points out that, "Climatic, soil and topographic variations are commonly interrelated. Variations in climate are often related to topography. Topography is often related to weathering and bedrock, which, along with slope impact soil development." And so on. It's fascinating to look at the mapping of the districts in this report and compare them to the two excellent series of maps prepared by Mike Bobbitt & Associates to accompany the climate study and by Coastal Viticultural Consultants to accompany the soils study. Various maps offer comparisons by degree days, by wind speed, by precipitation, by percent slope, soil texture, water holding capacity and other variables.

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The Livermore Valley Winegrowers Association does not consider these districts sub-AVAs, like Oakville and Rutherford in Napa Valley, and has not applied for official AVA status for them. However, the district boundaries and characteristics as described in the third report are dense with information, and convincing in their inherent

argument for seeing the Livermore Valley AVA not as a monolith but as a variegated, complex puzzle whose pieces are separated by nuances of their individual environments. Knowing that only 4,000 acres of the AVA are planted to grapevines, and that many of those acres are concentrated in one district, it's not a big leap to reach the conclusion that winemaking in the Livermore Valley

AVA may still be in its infancy. Many distinct combinations of district, varietal, rootstock, viticultural and enological practices remain to be explored. With that in mind, anyone seriously interested in California wine, from avid consumers, to media and trade members, to winemakers and growers will find this collection of reports and maps to be valuable--maybe even inspirational.



JIM GORDON, editor at large for *Wine Business Monthly*, writes and edits articles on grape growing, wine making and wine marketing. He has been covering wine and the wine business for more than 35 years, notably as the editor of *Wines & Vines* from 2006 through 2018. A role as contributing editor for *Wine Enthusiast* magazine began in 2014, in which he reviews California wines and reports on various California wine regions. He was executive director of the annual Symposium for Professional Wine Writers from 2008-2015. Dorling Kindersley (DK Books) of London published his first book as editor in chief, *Opus Vino*, in 2010, which was chosen a finalist in the James Beard Awards. In 2002 he was co-creator and managing editor of the long-running *Wine Country Living* TV series for NBC station KNTV in San Jose/San Francisco. He lives in Napa, California. Photos: Barry Zupan