Petition for a new AVA named San Luis Rey

Fallbrook, 7.9.2021

1. Introduction

The following petition serves as a formal request to the Alcohol and Tobacco Tax and Trade Bureau of the United States Treasury (TTB) for the establishment and recognition of an overlapping American Viticultural Area (AVA) to be named San Luis Rey within the existing South Coast AVA.

This petition contains all the information and supporting materials required to establish an AVA in accordance with Title 27 Code of Federal Regulations (CFR) part 9.12. The evidence is presented in the exhibits (page 23) and the methods of obtaining the information are presented in appendices (page 66).

2. Overview

The proposed San Luis Rey AVA is located within San Diego County, California, which in turn is located within the South Coast AVA. The South Coast AVA encompasses 2,148,780 acres and consists of three climate types and varied terrain. The South Coast AVA spans major sectors of coastal and inland southern California, including entire San Diego County and Orange County and portions of San Bernardino and Riverside Counties. Using the "South Coast AVA" is therefore not sufficient to describe the origin of the wines of the proposed San Luis Rey viticultural area.

The proposed San Luis Rey AVA covers 97,733 acres and includes approximately 285 acres of planted vines and planned plantings. Approximately 8% (Exhibit A) of the total proposed AVA acreage is occupied or has a potential to be occupied by commercial viticulture. There are 23 bonded wineries (Department of The Treeasury, Alcohol and Tobacco Tax and Trade Bureau, 2021) and approximately 44 commercial wine grape growers with at least 256 acres of planted vineyards (Exhibit B, Exhibit C). At least two additional growers are planning bonded wineries. The proposed area encompasses the watershed of lower San Luis Rey River, which drains into the Pacific Ocean and was named for the Mission San Luis Rey built on its bank. This petition is being submitted by Premium Vintners LLC, which operates Fallbrook Winery and farms several vineyards within the proposed AVA. Other winery operators and vineyard owners joining in this Petition are listed in Exhibit S, and collectively represent 70% (approximately 199 acres) of the existing commercial vineyard acreage within the proposed boundaries. While South Coast AVA and the proposed San Luis Rey AVA share some geographical features, this petition demonstrates that the proposed San Luis Rey viticultural area has its own set of unique characteristics that warrant separate recognition by the TTB and is supported by the scientific and historic evidence in the exhibits.

3. List of unique characteristics

- The average annual temperature is considerably more consistent within the proposed San Luis Rey AVA in comparison to the existing South Coast AVA.
- The average annual maximum temperature within the proposed San Luis Rey AVA is lower in comparison to the existing South Coast AVA, the nearby Temecula Valley AVA, the San Pasqual Valley AVA and the Ramona Valley AVA.
- The average maximum temperature during grape ripening months within the proposed San Luis Rey AVA is lower in comparison to the existing South Coast AVA, the nearby Temecula Valley AVA, the San Pasqual Valley AVA and the Ramona Valley AVA.

- The proposed San Luis Rey viticultural area has less growing degree days than the South Coast AVA, the nearby Temecula Valley AVA and the San Pasqual Valley AVA.
- The proposed San Luis Rey AVA is on average dryer than the existing South Coast AVA and nearby Temecula Valley and Ramona Valley AVAs. The proposed viticultural area benefits from a low risk of rain during spring and grape ripening season.
- During summer afternoons the proposed San Luis Rey AVA area typically experiences westerly winds from the Pacific Ocean which prevent temperatures to rise as high as nearby AVAs and helps prohibit fungal diseases of vines.
- The proposed San Luis Rey AVA has generally older geological rock in comparison with the rest of the South Coast AVA.
- The proposed San Luis Rey AVA has a considerably higher share of naturally fertile Alfisols in comparison with the entire South Coast AVA.
- The proposed San Luis Rey AVA has a considerably higher share of sandy loam, an ideal soil texture for grape vine growing in comparison with the South Coast AVA.
- Only one third of soil series present in the South Coast AVA are also present in the proposed AVA. The proposed AVA has considerably higher percent of area covered with Las Posas, Fallbrook, Vista, Las Flores and Placentia soil series.
- The proposed AVA has a higher share of granite, granodiorite, igneous rock, calcareous sandstone and quartz-diorite as soil parent material.
- The proposed AVA has lower average elevation and more consistent terrain in comparison to the South Coast AVA.
- The proposed AVA has in average 2° less slope in comparison to the South Coast AVA.
- Much of the proposed San Luis Rey AVA is rural residential area leading to a large number of small vineyards.

	In Proposed AVA	In Existing AVA	New or Shared Distinguishing Feature?
Climate: **Av. Temperature (°F)** Petition page: 9 Exhibit: Exhibit H	Mean long term: 63.11° F From 61° F to 65° F Standard deviation: 0.90	Mean long term: 63.11° F From 54° F to 66° F Standard deviation: 1.60	Shared, though less variation in the proposed AVA.
Climate: **Max. Annual Temperature (°F)** Petition page: 9 Exhibit: Exhibit I	Mean long term: 74.20° F Standard deviation: 1.80	Mean long term: 74.99° F Standard deviation: 2.52	New, lower average maximum annual temperature and less variation within the proposed AVA.
Climate: **Max. Temperature (°F) during ripening season** Petition page: 9 Exhibit: Exhibit J	Av. long term July: 82.89° F Av. long term August: 84.22° F Av. long term September: 82.78° F Av. long term October: 78.24° F	Av. long term July: 85.90° F Av. long term August: 87.28° F Av. long term September: 84.90° F Av. long term October: 78.89° F	New, lower average maximum temperature during grape ripening months in the proposed AVA.
Climate: **Growing Degree Days** Petition page: 10 Exhibit: Exhibit L	Long term mean GDD: 3849 Standard deviation: 194	Long term mean GDD: 3907 Standard deviation: 298	New, less growing degree days and less variation within the proposed AVA.
Climate: **Av. Annual Precipitation (in)** Petition page: 11 Exhibit: Exhibit M	Mean long term: 14.27 in Standard deviation: 1.61	Mean long term: 15.56 in Standard deviation: 3.40	New, less rain and less variation in the proposed AVA.
Climate: **Fog/Marine Influence** Petition page: 11 Exhibit: Exhibit N	Common in early morning during spring and early summer (May, June). Affects most of the area.	Not common in inland areas, affects only area by the Pacific coast.	Partially, not common in other than coastal areas. The proposed AVA is under coastal influence.
Climate: Wind Petition page:11 Exhibit:Exhibit O	Westerly afternoon breeze.	Westerly breeze where topography allows.	Shared in western part of the existing AVA.
Geology: **Predominant Lithology** Petition page: 11 Exhibit: Exhibit P	Older tonalite: 55% Older gabbro: 11% Younger mudstone: 15% Younger alluvium: 8% Younger sandstone: <1%	Older tonalite: 32% Older gabbro: 5% Younger mudstone: 7% Younger alluvium: 23% Younger sandstone: 13%	Partially shared, the proposed AVA has generally (higher share of) olderpredominant lithology.
Geology: Second Predominant Lithology Petition page: 11 Exhibit: Exhibit P	Mostly older quartz diorite: 55% Older diorite: 11% Younger mudstone: <1%	Older quartz diorite: 32% Older diorite: 5% Younger mudstone: 11%	Partially shared, the proposed AVA has generally (higher share of) older second predominant lithology.
Soil: Soil Organic Carbon Petition page: 12 Exhibit: Exhibit Q	Mean, 0-100 cm depth: 3336 g/m^2	Mean, 0-100 cm depth: 3525 g/m^2	Partially, the proposed AVA has in average slightly lower content of soil organic carbon per unit of area.
Soil: Taxonomy Petition page: 12 Exhibit: Exhibit Q	Naturally fertile Alfisols: 49%	Naturally fertile Alfisols: 37%	Partially shared, the proposed AVA has considerably higher share of Alfisols.
Soil: Texture Petition page: 12 Exhibit: Exhibit Q	Area with ideal soil texture sandy loam: 67%	Area with ideal soil texture sandy loam: 48%	Partially shared, the proposed AVA has considerably higher share sandy loam.

Soil: Soil Series Petition page: 13 Exhibit: Exhibit Q	Las Posas: 12.4% Fallbrook: 12.1% Vista: 7.6% Las Flores: 7.4% Placentia: 5.5% Visalia: 3.8%	Las Posas: 3.5% Fallbrook: 5.4% Vista: 2.9% Las Flores: 1.4% Placentia: 1.3% Visalia: 1.9%	Partially shared, only one third of soil series present in South Coast AVA are also present in the proposed AVA. The proposed AVA has higher percent of area covered with Las Posas, Fallbrook, Vista, Las Flores and Placentia soil series.
Soil: Soil Parent Material Origin Petition page: 12 Exhibit: Exhibit Q	Granite: 29% Granodiorite: 20% Sedimentary rock: 3% Igneous rock: 8% Calcareous sandstone: 8% Quartz-diorite: 6%	Granite: 23% Granodiorite: 13% Sedimentary rock: 7% Igneous rock: 5% Calcareous sandstone: 2% Quartz-diorite: 2%	Partially shared, the proposed AVA has higher share of granite, granodiorite, igneous rock, calcareous sandstone and quartz-diorite as parent material origin.
Elevation: Petition page: 15 Exhibit: Exhibit R	Minimum: 5 feet Maximum: 1796 feet Mean: 563 feet Standard deviation: 351	Minimum: 5 feet Maximum: 5597 feet Mean: 1132 feet Standard deviation: 697	New, lower mean elevation and more consistent terrain.
Slope : Petition page: 15 Exhibit: Exhibit R	Mean: 10°	Mean: 12°	New, in average 2° less slope.

4. Name Evidence

Most of the proposed San Luis Rey AVA is located within the San Luis Rey River watershed hence the name of proposed AVA (Exhibit D). The topography of the San Luis Rey River valley has a major effect on the climate in Fallbrook, Bonsall and Vista areas and therefore on the grape growing conditions and wine quality within the proposed AVA.

The name comes from the Mission San Luis Rey de Francia (named after Saint Louis IX, King of France), located on the hill overlooking the valley. We argue San Luis Rey is an appropriate name for the proposed AVA since the mission community funded by Franciscans (1798) established tradition of wine grape growing in this area based on the Mission grape. Evidence of the early wine grape growing in this area is supported by comments made by Auguste Bernard Duhaut-Cilly, a Frenchman, whom appreciated the wine made at the Mission San Luis Rey de Francia. In the document Duhaut-Cilly's Account of California in the Years, 1827-28 describes the Mission’s gardens: “These gardens produce the best olives and the best wine in all California” (Duhaut-Cilly, 1827-28).

San Luis Rey is commonly used in geographical and commercial feature’s names in the area. Evidence of San Luis Rey name use and recognition is enclosed in the following exhibits:

- Exhibit D: Map of proposed San Luis Rey AVA and watersheds showing Lower San Luis Rey River watershed;
- Exhibit E: USGS topographical map of San Luis Rey Quadrangle showing San Luis Rey River, San Luis Rey neighborhood and Old Mission San Luis Rey in Figure 5;
- Exhibit E: USGS topographical map of Bonsall Quadrangle showing a geographical name San Luis Heights in Figure 6.
- Exhibit E: Evidence of business names incorporating San Luis Rey and real estate featuring San Luis Rey neighborhood properties in Figure 7.

To the petitioner’s knowledge, there is no existing wine brand name in United States that includes the AVA name proposed in this petition.

5. Boundary Evidence

The proposed San Luis Rey AVA is located between latitudes 33°26'44"N and 33°8'34"N and longitudes 117°5'14"W and 117°23'12"W. The following boundary descriptions approximate the unique geography of San Luis Rey River valley and San Luis Rey wine growing region. The boundaries are dictated first by the topography which in turn defines climate including those areas along San Luis Rey River with the mean annual temperature below 65°F. The boundary excludes the area east of interstate I-15 and north of San Diego County border where the mean annual temperature exceeds 65°F. The northwest boundary is defined by the Marine Corps Base Camp Pendleton area, not suitable for viticultural activity. A small strip of land between the west boundary, which runs along I-5, and the Pacific Ocean is densely populated leaving no opportunity for viticulture. The southern boundary is again dictated by mean annual temperature in combination with geology and soil. Despite more developed and populated southern part of the proposed AVA, there are several vineyards planted in this area (Exhibit C).

The boundary was defined using the criteria described above, and where possible in a way that one can locate the boundary out in the field using visible geographical features.

The eight United States Geological Survey (USGS) 1:24,000 scale (7.5 - minute series) topographic maps used to determine the boundary of the San Luis Rey viticultural area are titled:

(1) Oceanside, CA, version2018;
(2) San Luis Rey, CA, version 2018;
(3) San Marcos, CA, version 2018;
(4) Valley Center, CA version 2018;
(5) Bonsall, CA, version 2018;
(6) Temecula, CA, version 2018;
(7) Fallbrook, CA, version 2018;
(8) Morro Hill, CA, version 2018;

Boundary

The San Luis Rey viticultural area is located in San Diego County, California. The boundary of the proposed San Luis Rey AVA is as described below:

1) The beginning point is on the Oceanside map at the intersection of Interstate Highway 5 and MCB Camp Pendleton boundary. From the beginning point, proceed northeast along MCB Camp Pendleton boundary for a total of 11.21 miles to the intersection of MCB Camp Pendleton boundary and NWS Seal Beach Fallbrook California boundary crossing to San Luis Rey and then to Morro Hill map; then
2) Proceed east and then north along NWS Seal Beach Fallbrook California boundary to the intersection with MCB Camp Pendleton boundary for 6.34 miles crossing to Bonsall map, back to Morro Hill map and then to Fallbrook map; then
3) Proceed north along the MCB Camp Pendleton boundary for a total of 0.51 mile to the intersection with De Luz Road; then
4) Proceed east on De Luz Road for a total of 0.38 mile to the intersection of De Luz Road and Sandia Creek Drive; then
5) Proceed north on Sandia Creek Drive for a total of 3.98 miles to the intersection of Sandia Creek Drive and an unnamed road known locally as Sawday Road crossing to Temecula map; then
6) Proceed east on Sawday Road for a total of 0.21 mile to the intersection of Sawday Road and San Diego County border; then
7) Proceed south and then east along San Diego County border for a total of 6.72 miles to the intersection of San Diego County border and an unnamed road known as Old Highway 395; then
8) Proceed south on Old Highway 395 for a total of 14.19 miles to the intersection of Old Highway 395 and an unnamed road known locally as Old Castle Road crossing to the Bonsall map; then
9) Proceed east on Old Castle Road for a total of 0.59 mile to the intersection of Old Castle Road and Gordon Hill Road crossing to San Marcos map; then
10) Proceed southeast on Gordon Hill Road for a total of 0.92 mile to the intersection of Gordon Hill Road and 800-foot elevation contour; then

11) Proceed east along 800-foot elevation contour for a total of 2.50 miles to the intersection of 800-foot elevation contour and Canyon Country Lane crossing to Valley Center map; then
12) Proceed northwest and then south on the Canyon Country Lane for a total of 0.83 mile to the intersection of the Canyon Country Lane and 1240-foot elevation contour; then
13) Proceed east along the 1240-foot elevation contour for a total of 2.90 miles to the intersection of 1240-foot elevation contour and Cougar Pass Road; then
14) Proceed west then south along Cougar Pass Road for a total of 0.40 mile to the intersection of Cougar Pass Road and Meadow Glen Way East; then
15) Proceed west then south along Meadow Glen Way East for 0.46 mile to the intersection of Meadow Glen Way East and Hidden Meadows Road; then
16) Proceed southwest along Hidden Meadow Road for a total of 0.73 mile to the intersection of Hidden Meadow Road and Mountain Meadow Road; then
17) Proceed southwest along Mountain Meadow Road for another 1.44 miles; then
18) Proceed southwest along an unnamed road known locally as Deer Springs Road for another 2.42 miles, crossing onto the San Marcos map; then
19) Proceed south along an unnamed road known locally as North Twin Oaks Valley Road for a total of 3.01 miles to the intersection of North Twin Oaks Valley Road and an unnamed road known locally as West Mission Road; then
20) Proceed northwest along West Mission Road for another 3.8 miles to the intersection of Sycamore Avenue; then
21) Proceed southwest along Sycamore Avenue for 0.55 mile to the intersection of Sycamore Avenue and State Highway 78; then
22) Proceed west along State Highway 78 for a total of 9.09 miles to the intersection of State Highway 78 and Interstate Highway 5, crossing onto the San Luis Rey map; then
23) Proceed north along Interstate Highway 5 for a total of 3.14 miles, crossing onto the Oceanside map returning to the beginning point.

Maps with delineated boundaries are presented in

Exhibit F.

6. Geography

The proposed San Luis Rey viticultural area is located between the coast of Pacific Ocean on the southwest, Camp Pendleton on the west, Santa Margarita Ecological Reserve on the north, Monserate Mountain and Lancaster Mountain on the east and Escondido, San Marcos and Carlsbad towns on the south. The area encompasses Fallbrook, Bonsall, Oceanside, Vista and partially San Marcos communities. Geologically a subset of Peninsular Ranges, represented by Peninsular Ranges Batholith has the main impact on the topography of the proposed San Luis Rey AVA area.

Most of the hilly terrain is located within the Lower San Luis Rey River watershed (Figure 4). The San Luis River valley allows coastal influences to move inland reducing the maximum temperature typical for the Temecula Valley AVA, San Pasqual Valley AVA and Ramona Valley AVA in proximity to the proposed viticultural area and encompassed by the South Coast AVA.

Population density in the proposed San Luis Rey viticultural area increases in north to south direction from 100 or less people per square mile in Fallbrook area to 1000 – 10000 people per square mile (Dion-Watson, 2014) in Oceanside, Vista and San Marcos areas. Much of the area east of Oceanside and Vista is considered semi-rural with smaller rural areas in the north and east part of the proposed San Luis Rey AVA (San Diego County, 2011). 15.3% of the proposed area is classified as agricultural land and more than half of it is defined as vineyard or orchard. 23.8% of the land is considered rural residential (Exhibit A). Rural residential category includes single family homes located on lot sizes greater than 1 acre and parcels of land that are associated with them. Rural residential land offers space for low-intensity farming activities and is often planted with grape vines.

Vineyards within the proposed viticultural area are usually irrigated. Well water is often used for irrigation as well as water from public sources due to high level of chlorides in well water.

7. Distinguishing Features

Climate: Temperature

The proximity of the proposed San Luis Rey AVA to the Pacific Ocean generally moderates the temperature extremes, creating mild winters and summers with lower maximum temperatures. The winters near the coast are typically warmer and the summers are usually cooler compared to inland valleys (Northwest Alliance for Computational Science & Engineering (NACSE), 2015)(Climate of California, 2019). As evidenced in the exhibits the proposed San Luis Rey viticultural area has a distinctive climate within the existing South Coast AVA.

The proposed AVA experiences very little frost, with the first frost day generally occurring end of November or beginning of December and the last frost day usually doesn't occur after beginning of March (Table 4). Frost occurs very early in the season or very late in autumn and is too mild to affect grape vine growth in spring or ripening consistency by the end of the season.

The map and statistics for 30 year average mean temperatures in Exhibit H indicate that the mean annual temperature is the same (63.11 °F) but more consistent (from around 61 to 65 °F) within the proposed San Luis Rey AVA in comparison to the South Coast AVA (from around 54 to 66 °F) as a result of the wide extent of South Coast AVA covering areas with various climate conditions. The average annual mean temperature in the southwestern part of proposed San Luis Rey AVA gradually increases inland in northeast direction. The San Luis Rey River valley enables passage of the ocean breeze inland to the central area of the proposed AVA, keeping the average annual mean temperature lower compared to the temperatures we can find in nearby Temecula Valley AVA and San Pasqual Valley AVA (Table 5).

Lower average mean temperature in the proposed viticultural area is consistent with lower average maximum temperatures. This is especially true during grape ripening season in July, August, September and October. Statistics in Table 6 shows the proposed San Luis Rey viticultural area has the lowest value (74.20°F) presenting mean long term annual maximum temperature within all existing South Coast AVAs (Exhibit I). Further, Exhibit J presents the comparison of maximum temperatures during grape ripening season in July, August, September and October. One can observe the proposed San Luis Rey AVA has over 3°F lower maximum July and August temperature in comparison with South Coast AVA and over 10°F lower maximum July and August temperature in comparison with nearby Temecula Valley AVA

(Table 7). During the final grape ripening months the maximum temperature in the proposed San Luis Rey AVA is also the lowest among all South Coast AVAs. Average September and October maximum temperatures in the proposed viticultural area are around 2° F – 6 °F and 0.65° F – 4.15 respectively lower than the average maximum temperatures in other South Coast AVAs (Table 7, Figure 10, Figure 11, Figure 12, Figure 13).The prolonged temperatures over ninety degrees Fahrenheit cause loss of flavor and aroma components in grapes. Maximum temperatures in South Coast AVA itself and other AVAs within South Coast are evidently higher. The impact of the Pacific Ocean on coastal areas does however weaken towards the end of grape ripening season with hot inland temperatures moving towards the west.

The following exhibits provide evidence about the temperature conditions in the proposed San Luis Rey AVA in relation to South Coast AVA:

- Map of average annual mean temperature within South Coast AVAs in Figure 8;
- Map of average annual maximum temperature within South Coast AVAs in Figure 9;
- Map of average July maximum temperature within South Coast AVAs in Figure 10;
- Map of average August maximum temperature within South Coast AVAs in Figure 11;
- Map of average September maximum temperature within South Coast AVAs in Figure 12;
- Map of average October maximum temperature within South Coast AVAs in Figure 13;
- Statistic for average annual temperature in Table 5;
- Statistic for average annual maximum temperature in Table 6;
- Statistic for average July, August, September and October maximum temperature in Table 7.

Climate: Diurnal Temperature Variation

The proposed San Luis Rey AVA experiences diurnal variation in temperature between 22°F - 23°F during grape ripening season in July, August, September and October (Table 8). Diurnal temperature variation has an important role preserving the balance of sugar accumulation during the day heat and natural fruit acidity during the cooler night time.

Exhibit K presents average diurnal temperature variation of the proposed San Luis Rey AVA in relation to surrounding AVAs.

Climate: Growing Degree Days (GDD)

Compared to South Coast, Temecula Valley and San Pasqual Valley AVAs, the climate is less warm within the proposed boundaries of the San Luis Rey AVA as a result of cooling impact of the Pacific Ocean from the west keeping down growing season temperatures (Exhibit L) and causing morning marine fog cover in the first half of growing season. This impact weakens north, east and south east of the proposed San Luis Rey AVA boundary. Proposed San Luis Rey viticultural area has 58 less growing degree days than South Coast AVA, 369 growing degree days less than nearby Temecula Valley AVA and 273 less growing degree days than San Pasqual Valley AVA (Table 9).

Climate: Precipitation

The rainy season in the proposed San Luis Rey AVA and surrounding area is from November to April. From May to October rain is rare and apart from the morning fog typical for May and June the humidity is generally low.

Average yearly rainfall in proposed San Luis Rey AVA increases from under 12 inches in the coastal area to around 17 inches at the northwestern border (Exhibit M). Proposed San Luis Rey AVA is in average dryer than South Coast (1.29 inches lower precipitation), Temecula Valley (3.07 inches lower precipitation) and Ramona Valley (3.6 inches lower precipitation) AVAs (Table 10). The proposed viticultural area benefits from low risk of rain during spring and grape ripening season which can cause bloom disruption, split berries and ripening disruption.

Climate: Low Cloud / Fog / Marine Influence

Beside topography, surface heating and surface moisture; the coastal low clouds are influenced by surface sea temperature. Cool Pacific current and up-welling of cold subsurface Ocean water create coastal low clouds affecting San Luis Rey Valley, Fallbrook, Vista and San Marcos area. Coastal low clouds are particularly common in early mornings during spring and early summer (May, June), contributing to lower near coastal air temperatures (Climate of California, 2019) and prevent fast evaporation and transpiration. Figure 17 in Exhibit N captures nine 17 day averages (data covers summers from 1996 to 2014) of the coastal low cloud seasonal cycle. At the beginning of May roughly 30% of measurements detected coastal low cloud in the area of proposed San Luis Rey AVA. By the end of September the percentage drops to around 20% (Schwartz, 2015). Figure 17 demonstrates the coastal low clouds don't affect inland areas of South Coast AVA, east of San Luis Rey AVA boundary and so create a specific climate condition protecting grapevines from the summer heat in late mornings and preventing maximum daily temperatures to rise high as it is typical for the nearby Temecula Valley AVA, San Pasqual Valley AVA and Ramona Valley AVA.

Climate: Wind

Winds in the proposed San Luis Rey AVA are generally mild, most of the time less than 10 miles per hour; in the Fallbrook area less than 15 miles per hour (WeatherFlow Inc., 2020). During summer afternoons the area typically experiences persistent westerly winds from the coast which prevent the temperatures to rise as high as in nearby AVAs. These winds also help prohibit fungal diseases such as powdery mildew. Strong winds occur occasionally and are usually associated with migrant storms in winter. In fall and winter the area occasionally experiences strong, gusty flows of air from north or east, usually dry and warm (Soil Conservation Service and Forest Service; UC Agricultural Experiment Station; the Bureau of Indian Affairs; US Marine Corps; Department of Housing and Urban Development; County of SD Planning Departmen; Comprehensive Planning Organization, 1973).

Exhibit O provides evidence supporting the statements related to direction and speed of wind in the proposed San Luis Rey AVA.

Geology

The area of proposed San Luis Rey AVA is part of Peninsular Ranges, stretching from Riverside County to Baja California on the south. The oldest rock, Triassic Julian Schist was reduced by uplift and erosion as a result of collisions of lithospheric plates. The remains are found in the southeastern part (east of Vista) and northwest corner (northwest of Fallbrook) of the proposed San Luis Rey AVA. Santiago Peak Volcanics, mainly composed of volcanic flows and breccias accompanied with sedimentary materials and shallow – level intrusions are also present in minority. Santiago Peak Volcanics are found in minor representation south of Bonsall and east/southeast of Vista. The main portion of this volcanic system is from late Jurassic to early Cretaceous period. Most of the proposed AVA area is represented by younger rocks forming Peninsular Ranges Batholith. These igneous rocks have the main impact on the topography of the proposed San Luis Rey AVA area. Three main plutonic rock types of western Peninsular Ranges Batholith are gabbro, tonalite and monzogranite. These three rock types were chemically weathered over time from Late Cretaceous and Early Eocene. Rainfall combined with elevated levels of atmospheric carbon dioxide and decaying vegetation converted near-surface minerals forming these rocks to clays, silica and soluble materials. More fractured tonalities have undergone more intense chemical weathering compared to gabbros and monzogranites. Erosion removed tonalite debris left the other two rock types as topographic highs. Rainwater combined with carbon dioxide in the atmosphere shaped the remaining rocks to rounded solid rock. Decomposed and more easily eroded material was stripped away leaving large rounded boulders scattered across the landscape (Walawender, 2000). The southwestern part of proposed San Luis Rey AVA is geologically the youngest part formed of mudstone and sandstone. Unlike the South Coast AVA, Temecula Valley AVA and San Pasqual AVA, where alluvium covers big portion of the area, Figure 19 and Figure 20 show geology in proposed San Luis Rey AVA differs from nearby wine regions. Geologically recent alluvium deposits, including sand, gravel, silt and clay (Pliocene to Holocene) in the proposed area is found in minority (along San Luis Rey River); instead over 55% of the area has older predominant tonalite lithology from Middle Jurassic to Late Cretaceous (San Diego County, 2011). Gabbro (Triassic to Cretaceous) as well as mudstone (Paleocene to Oligocene) have considerably bigger share of the proposed San Luis Rey AVA compared to any other AVA within the South Coast AVA (Table 11).

Exhibit P provides evidence supporting those sections critical for development of San Luis Rey AVA topography, geology and soil:

- Map of geologic age across South Coast AVAs in Figure 18;
- Map of predominant lithology across South Coast AVAs in Figure 19;
- Map of second predominant lithology across South Coast AVAs in Figure 20;
- Table of predominant and second predominant lithology within South Coast AVAs in Table 11.

Soils

The proposed San Luis Rey viticultural area spans across two physiographic provinces: Coastal Plains and Foothills. Coastal Plains with its rolling to steep topography and a series of terraces encompasses towns of Oceanside and Vista and is characterized by interbedded marine and nonmarine sedimentary rock units that overlie plutonic rocks composed of granite and granodiorite (San Diego County, 2011). The soils are fine to coarse texture consisting of calcareous subsoil. Source rock of the soils in the Foothills area (Fallbrook, Bonsall and San Marcos) varies and generally consists of tonalite, granodiorite and gabbro. These rocks disintegrate to a considerable depth and soils that develop in gabbro deposits are of sandy loam texture in the surface layer and are fairly deep, containing angular stone fragments. Metasedimentary and metavolcanic rocks are hard and have not undergone weathering process. Soils developed from these rocks are shallow or moderately deep containing rock fragments. Alluvium consisting of gravelly sandy loam and fine sandy loam in the Foothills is mostly derived from granitic rock (San Diego County Water Authority, 2003).

Nearly 50% of the proposed San Luis Rey viticultural area belongs to Alfisols that have relatively high native fertility suitable for agricultural use with high concentration of Ca, Mg, K and Na cations (Plant and Soil Sciences eLibrary, 2020a). Entisols cover approximately 15% of the proposed San Luis Rey viticultural area. Typically lacking horizons these soils vary in productivity potential. If alluvial soils, as in the case of San Luis Rey viticultural area, Entisols can be very productive (Plant and Soil Sciences eLibrary, 2020b). 12% of the proposed San Luis Rey AVA is covered by Inceptisols, which soil profile is at the beginning of its development. The natural productivity of Inceptisols depends on clay and organic matter content (Plant and Soil Sciences eLibrary, 2020c). Naturally fertile Mollisols are presented in 11% of San Luis Rey viticultural area and are characterized by dark, rich with organic matter topsoil. These soils are saturated with essential plant nutrients (Ca^{2+}, Mg^{2+}, Na^{+}, and K^{+}) and are not hard or very hard when dry (Soil Survey Staff, 1999)(Plant and Soil Sciences eLibrary, 2020d). 5% of the total proposed AVA and only in the southwestern part we find Vertisols with high content of clay. These soils shrink when dry and show the cracks causing surface material mixing with subsoil. These soils are usually very dark with variable organic matter content (Plant and Soil Sciences eLibrary, 2020e).

An analysis of soil covering the area of South Coast AVA shows the proposed San Luis Rey AVA has on average lower levels of soil organic carbon in 0 - 100 cm (0 - 39.4 inch) zone depth compared to South Coast AVA (Figure 23, Table 14). Soil organic carbon is related to soil fertility. Not excessively fertile soil decreases plant vigor. In viticulture this means smaller canopy, clusters and berries with enhanced flavor concentration in grapes (avoiding over-cropping), less leaves and less shade on the fruit improves color and reduces green flavors.

The proposed San Luis Rey viticultural area has considerably higher share of area with sandy loam soil texture (69%) compared to the existing South Coast AVA (52%). Loam (74% in San Luis Rey AVA, 72% in South Coast AVA) is generally considered as an ideal soil texture because of an even mixture of all the soil separates and its ability of holding water but still draining and aerating well. It can be easily worked with agricultural tools. Loamy soils can produce too vigorous vines, however, in the case of the proposed San Luis Rey AVA most of the area soil is of sandy loam texture. Sandy loam has lower cation exchange capacity (CEC) reducing the nutrient availability to a level optimal for grape vine growing (low vigor, smaller berries, increased skin-to-juice ration during fermentation).

Soil within the proposed AVA is generally well drained with fairly rapid runoff and slow permeability. Most of the soil is slightly acid to neutral; a smaller percentage is mildly alkaline.

Soils covering the proposed San Luis Rey AVA belong to over 40 different soil series (consociations, complexes or associations). Table 15 in Exhibit Q provides information on acreage and percentage of the area covered by particular soil series. Only around one third of the soil series existing within South Coast AVA are also present within the proposed San Luis Rey AVA. San Luis Rey AVA has a considerably higher percent of area covered with Las Posas, Fallbrook, Vista, Las Flores and Placentia soil series compared to South Coast AVA.

Las Posas Series

Covering 12.4% of the total proposed San Luis Rey AVA. Formed from weathered material of basic igneous rocks, these series consist of well drained and fairly deep fine sandy loams with a clay subsoil.

Runoff is medium to rapid with slow permeability. Representative samples appear brown to reddish brown with fine sandy loam, loam or clay loam, slightly acid or neutral around 12 inches thick. The subsoil color is brown and red with neutral or mildly alkaline heavy clay loam or clay about 20 inches thick. Substratum is yellowish red or pale brown from weathered gabbro about 22 inches thick (Soil Survey Staff). Las Posas series is found north east of Fallbrook town and east of Vista town.

Fallbrook Series

Covering 12.1% of the total proposed San Luis Rey AVA. Formed from weathered material of granitic rocks, these series consist of deep, well drained sandy loams with medium to very rapid runoff and moderately slow permeability. Representative profile appears dark brown to yellowish brown with loam, fine sandy loam or sandy loam around 6 inches thick surface soil. Subsoil is mostly reddish brown ranging to light brown or brown heavy loam, clay loam or sandy clay loam with 18 up to 30 % clay around 41 inches thick. Surface soil and subsoil are slightly acid or neutral. Substratum is light red, reddish brown to pink brownish gray or black decomposed granodiorite around 43 inches thick (Soil Survey Staff). Fallbrook series are found around Fallbrook town area all the way to Bonsall area and around Vista town.

Cieneba Series

Covering 10.4% of the total proposed San Luis Rey AVA. Formed in weathered material from granitic and other rocks of similar texture and composition, these series consist of very shallow and shallow excessively drained soil with low to high runoff. Permeability is moderately rapid in the soil but much slower in the bedrock. Representative profile appears pale brown, moderately acid fine gravelly loam in surface soil about 10 inches thick. Below is reddish yellow and brown weathered granitic material with some loam material (Soil Survey Staff). Cieneba series is found east of Fallbrook town and, Bonsall area and in eastern most part of proposed San Luis Rey AVA.

Vista Series

Covering 7.6% of the total proposed San Luis Rey AVA. Formed in material weathered from decomposed granitic rocks, Vista series are fairly deep and well drained soils. In a representative profile, the surface soil is dark grayish brown coarse sandy loam with fairly fine and medium crumb structure to weak fine and medium granular structure, neutral to slightly acid, around 19 inches thick. Subsoil is brown or yellowish brown coarse sandy loam around 16 inches thick. Substratum is yellowish brown, brown and very pale brown weathered quartz diorite grus around 26 inches thick (Soil Survey Staff). Vista series can be found scattered in Fallbrook and Bonsall area and around Vista town.

Las Flores Series

Covering 7.4% of the total proposed San Luis Rey AVA. Formed in material weathered from consolidated siliceous marine sandstone, Las Flores series are moderately well drained soils with medium to rapid runoff and very slow permeability. Typically these series have light brownish gray, slightly and medium acid loamy sand in the surface soil about 14 inches thick. Subsoil is grayish brown and light brownish gray, slightly acid and neutral sandy clay around 24 inches thick. Substratum is pale yellow loamy coarse sand and light gray soft marine sandstone about 16 inches thick (Soil Survey Staff). Las Flores series are found in Oceanside area, west of Vista and Bonsall towns.

Placentia Series

Covering 5.5% of the total proposed San Luis Rey AVA. Formed in alluvium from granite and other rocks of similar composition and texture, Placentia series are well or moderately well drained with slow to rapid runoff and very slow permeability. Surface soil is brown, medium acid sandy loam about 13 inches thick. Subsoil is dark reddish brown clay and heavy sandy clay about 45 inches thick. Substratum is brown gravelly sandy loam 10 inches thick (Soil Survey Staff). Placentia series is found scattered in Fallbrook and Bonsall area and around Vista town.

Visalia Series

Covering 3.8% of the total proposed San Luis Rey AVA. Moderately well drained and very deep sandy loams derived from granitic alluvium. Surface soil is dark grayish brown, slightly acid sandy loam about 12 inches thick. Subsoil is dark grayish brown, slightly acid sandy loam and loam about 48 inches thick. Some areas have soil gravelly throughout (Soil Conservation Service and Forest Service; UC Agricultural Experiment Station; the Bureau of Indian Affairs; US Marine Corps; Department of Housing and Urban Development; County of SD Planning Departmen; Comprehensive Planning Organization, 1973). Visalia series are found in Fallbrook in the valleys along South Mission Road, Gird Road, Highway 15, in Bonsall along Camino Del Rey and in Oceanside along lower San Luis Rey River.

Diablo Series

Covering 3.7% of the total proposed San Luis Rey AVA. Well drained, slow runoff when soil is dry and medium to rapid when soil is moist with slow permeability. These soils formed in residuum weathered from shale and sandstone. In a representative profile Diablo soils have dark gray, neutral and mildly alkaline silty clay surface soil layer about 15 inches thick with calcareous silty clay lower surface sol layer. Subsoil is also gray to olive gray silty clay 27 inches thick and Substratum is 18 inches thick olive gray and light olive gray silty clay loam that rest on shale (Soil Survey Staff). These soils are found in the very bottom west part of proposed San Luis Rey AVA west of Vista town.

Exhibit Q provides evidence of soil specifics in San Luis Rey AVA and the differences compared to South Coast AVA:

- Map of soil parent material origin across South Coast AVA in Figure 21;
- Soil parent material area share within South Coast AVAs in Table 12;
- Map of soil taxonomy order within South Coast AVAs in Figure 22;
- Soil taxonomy order within South Coast AVAs in Table 13;
- Map of soil organic carbon within South Coast AVAs in Figure 23;
- Average soil organic carbon content in Table 14;
- Map of soil series in the proposed San Luis Rey AVA in Figure 24;
- Soil series share within South Coast AVA and proposed San Luis Rey AVA in Table 15;
- Soil texture within South Coast AVA and proposed San Luis Rey AVA in Table 16.

Physical Features: Elevation and slope

The elevation within the proposed San Luis Rey AVA boundaries stretches from 5 ft to 1796 ft with the mean elevation of 563 ft. The area has a distinguishable lower mean elevation and more consistent terrain in comparison with the South Coast AVA (1132 ft) which stretches from Pacific Ocean on the west to Santa Ana Mountains on the north-east and Volcan Mountains on the south-east with elevation reaching 5597 ft (Table 17). Terrain in the proposed viticultural area is mostly hilly with the average 10°

slope (Table 18). Lower elevation and the terrain configuration in the proposed viticultural area eliminate spring frost that can affect growth at the beginning of the growing season and crop ripening consistency.

The terrain of the proposed San Luis Rey AVA and the proximity of the Pacific Ocean minimize the annual temperature variation. The San Luis Rey valley allows daily afternoon Ocean breezes to pass eastwards into the proposed viticultural area (Figure 25) preventing high maximum temperatures as observed in the South Coast and nearby Temecula Valley, Ramona Valley and San Pasqual Valley AVAs. Afternoon breezes also reduce the disease pressure caused by the moisture occurring during morning low cloud in the first half of the growing season.

We provide the following evidence of physical features of the proposed San Luis Rey AVA to support its unique characteristics in Exhibit R:

- Three-dimensional representation of terrain in South Coast AVA demonstrating how cool air from the Pacific Ocean passes through San Luis Rey valley and has a cooling and disease prevention effect on the proposed San Luis Rey AVA in Figure 25;
- Digital elevation model statistics for areas within South Coast AVAs in Table 17;
- Slope analysis statistic for areas within South Coast AVAs in Table 18.

8. Conclusion

While the proposed San Luis Rey AVA shares some geographical characteristics with the existing South Coast AVA, the climate and the topography with geology and soil affect the wine grape development making a case for a distinguishing appellation of origin. The proposed viticultural area has the same mean annual temperature as the existing South Coast AVA. However, the temperature over the proposed area is more consistent and lower average annual maximum temperature, July, August, September and October maximum temperatures make a significant difference in grape flavor development in comparison to surrounding areas. The geology and soil of the proposed area is typical for only some parts of the existing South Coast AVA. The influence of the Pacific Ocean creates particular climate conditions for the entire proposed San Luis Rey AVA, in comparison the South Coast AVA only has a partial marine influence. The elevation and terrain are the main keys for distinct environmental context that gives the grapes from the proposed San Luis Rey AVA its own character and produce unique wines among South Coast AVA wines.

The petitioner believes the scientific and historical evidence in this petition suffice to demonstrate that the defined San Luis Rey viticultural area deserves to be recognized as a sub AVA within the larger South Coast AVA.

9. Abbreviations

AVA -American Viticultural Area
CFR – Code of Federal Regulations
SLR – San Luis Rey

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11. Exhibits

Exhibit A. Landuse within proposed San Luis Rey AVA

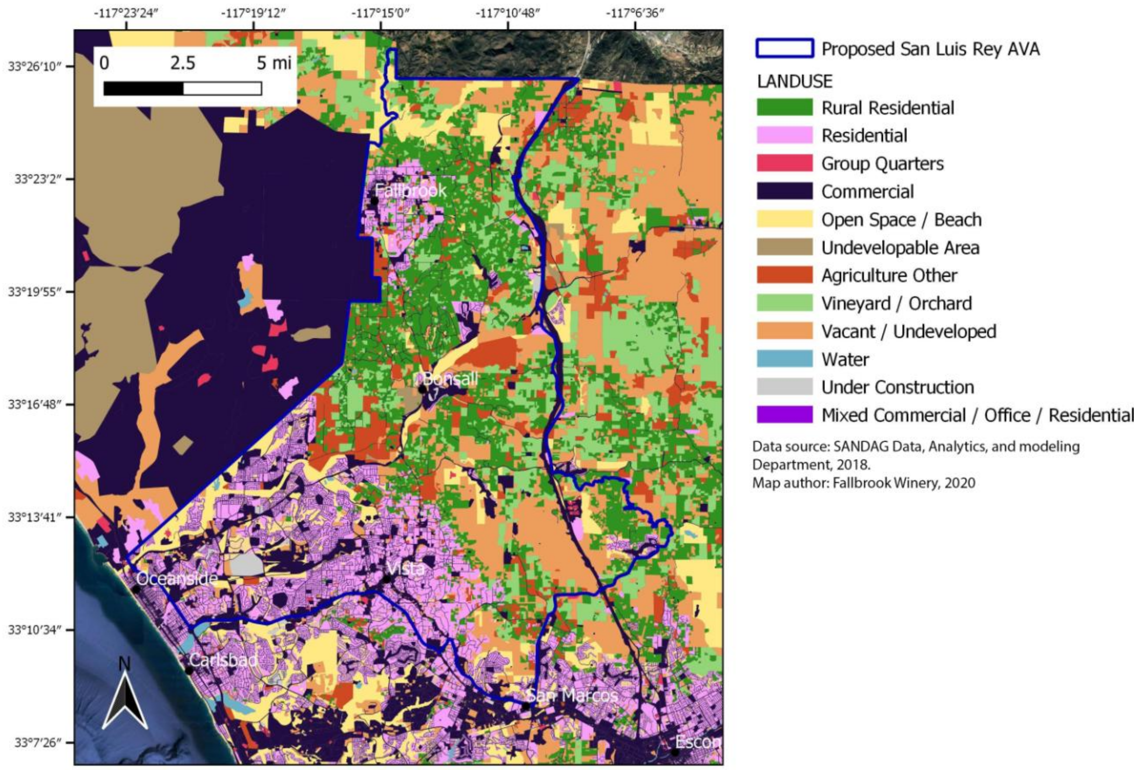


Figure 1.Landuse within the proposed San Luis Rey AVA

Table 1. Reclassification of SANDAG landuse codes

Reclassification Code	**Description**	**Acres**	**% of total area**
97	Mixed Commercial / Residential / Office	14.9	<0.1
90	Water	99.4	0.1
30	Group Quarters	210.5	0.2
60	Undevelopable Area	337.7	0.3
95	Under Construction	666.9	0.7
70	Agriculture Other	6851.5	7.0
71	Vineyard / Orchard	8123.4	8.3
50	Open Space / Beach	9350.1	9.6
40	Commercial	14704.7	15.0
80	Vacant / Undeveloped	16385.5	16.8
20	Residential	17676.2	18.1
10	Rural Residential	23307.3	23.8

Landuse data was retrieved, processed and analyzed as described in Appendix 1, section Land Use.

Exhibit B. Bonded wineries within the Proposed San Luis Rey AVA

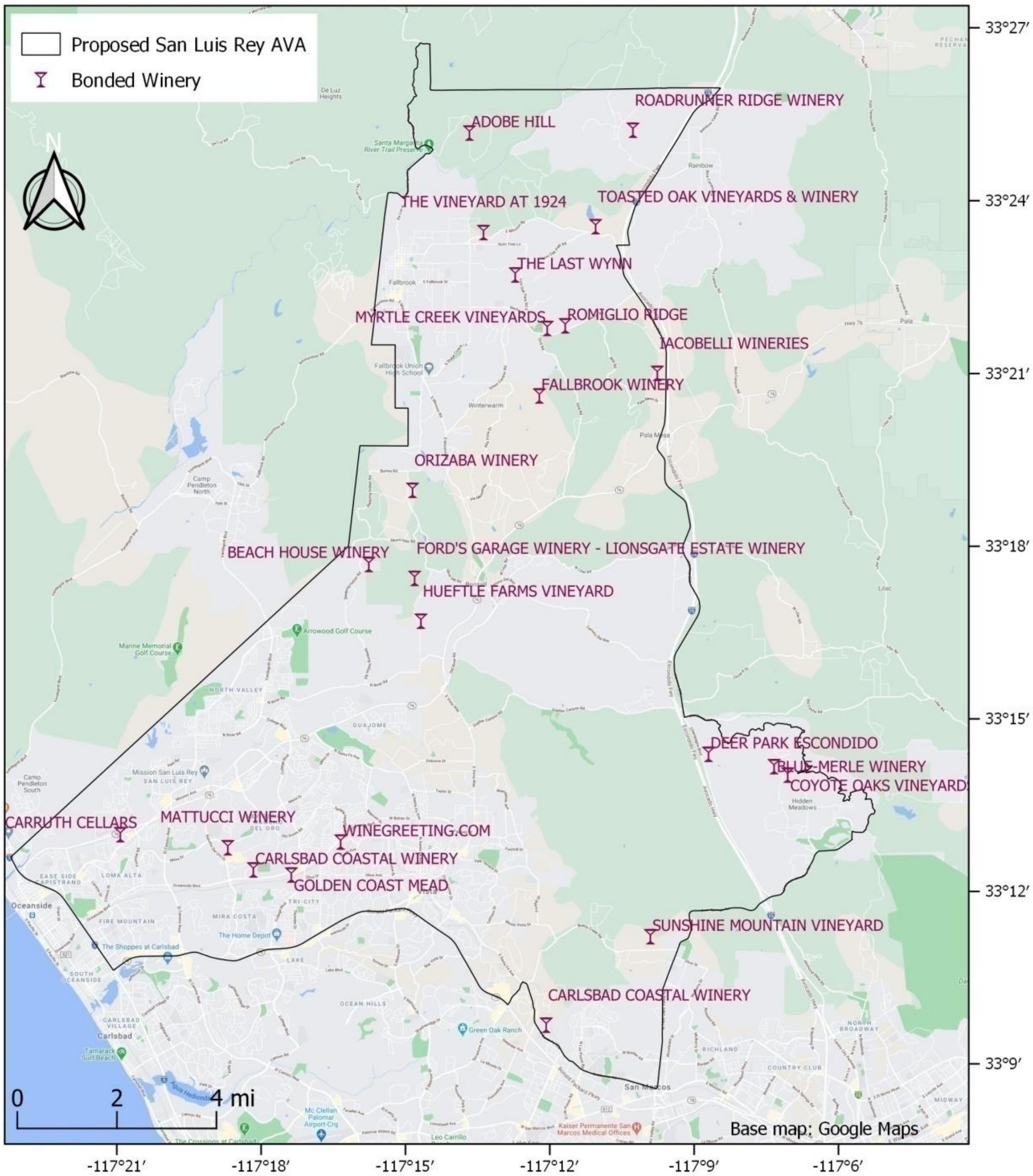


Figure 2. Map of bonded wineries within the proposed San Luis Rey AVA. Map author: Fallbrook Winery, 2021

Table 2. Bonded Wineries in the proposed San Luis Rey AVA (Department of The Treeasury, Alcohol and Tobacco Tax and Trade Bureau, 2021)

Permint No.	Owner Name	Operating name	Street	City	ZIP
CA-W-23224	Hueftle Inc	Hueftle Farms Vineyard	4582 Valle Del Sol	Bonsall	92003
CA-W-23285	Lionsgate Estate & Vineyard LLC	Ford's Garage Winery - Lionsgate Estate Winery	31809 Paseo Lindo	Bonsall	92003
CA-W-17254	Coyote Oaks Vineyards, LLC		9843 Oak Ridge Rd	Escondido	92026
CA-W-17073	Alliance International Trade & Investment Group, Inc.	Blue-Merle Winery	9709 Canyon Country Ln	Escondido	92026
CA-W-3030	Deer Park Escondido, LLC	Deer Park Escondido	29013 Champagne Blvd	Escondido	92026
CA-W-2683	Premium Vintners, LLC		2554 Via Rancheros	Fallbrook	92028
CA-W-21462	Myrtle Creek Vineyards LLC		1600 Via Vista Dr Bldg	Fallbrook	92028
CA-W-15878	Samuel D. & Leslie B. Oriza	Orizaba Winery	158 Calle Linda	Fallbrook	92028
CA-W-20408	Tom Bourne Carson	The Vineyard At 1924	1924 E Mission Rd	Fallbrook	92028
CA-W-23981	Adobe Hill, Ltd.	Adobe Hill	40740 Via Ranchitos	Fallbrook	92028
CA-W-17277	Beach House Winery, Inc.	Beach House Winery	1534 Sleeping Indian Rd	Fallbrook	92028
CA-W-23543	RomiglioRidge LLC	Romiglio Ridge, LLC	1651 Scooter Ln	Fallbrook	92028
CA-W-17257	James Harold & Judith Anne Brady	Roadrunner Ridge Winery	4233 Rosa Rancho Ln	Fallbrook	92028
CA-W-17396	R.L. Trillium, LLC	Iacobelli Wineries	2175 Tecalote Dr	Fallbrook	92028
CA-W-23598	The Last Wynn LLC		249 Via De Amo	Fallbrook	92028
CA-W-20068	Marcia Flowers	Toasted Oak Vineyards & Winery	190 Red Mountain Ln	Fallbrook	92028
CA-W-20335	Paul Douglas Mattucci	Mattucci Winery	3728 Maritime Way Bldg 42	Oceanside	92056
CA-W-16278	Fifty Barrels, Inc.	Carlsbad Coastal Winery	3800 Oceanic #106	Oceanside	92056
CA-W-17723	Winegreeting.Com, Inc.	Winegreeting.Com	4747 Oceanside Blvd Suite E	Oceanside	92056
CA-W-21158	Golden Coast Mead LLC	Golden Coast Mead	4089 Oceanside Blvd Ste H	Oceanside	92056
CA-W-23426	Carruth Cellars, LLC	Carruth Cellars	3229 Roymar Rd	Oceanside	92058
CA-W-17713	Sunshine Mountain Vineyard, Inc.	Sunshine Mountain Vineyard	2286 Sunshine Mountain Rd	San Marcos	92069
CA-W-15276	Fifty Barrels, Inc.	Carlsbad Coastal Winery	2930 Norman Strasse Rd Suite 103	San Marcos	92069

Exhibit C. Existing vineyards within the proposed San Luis Rey AVA

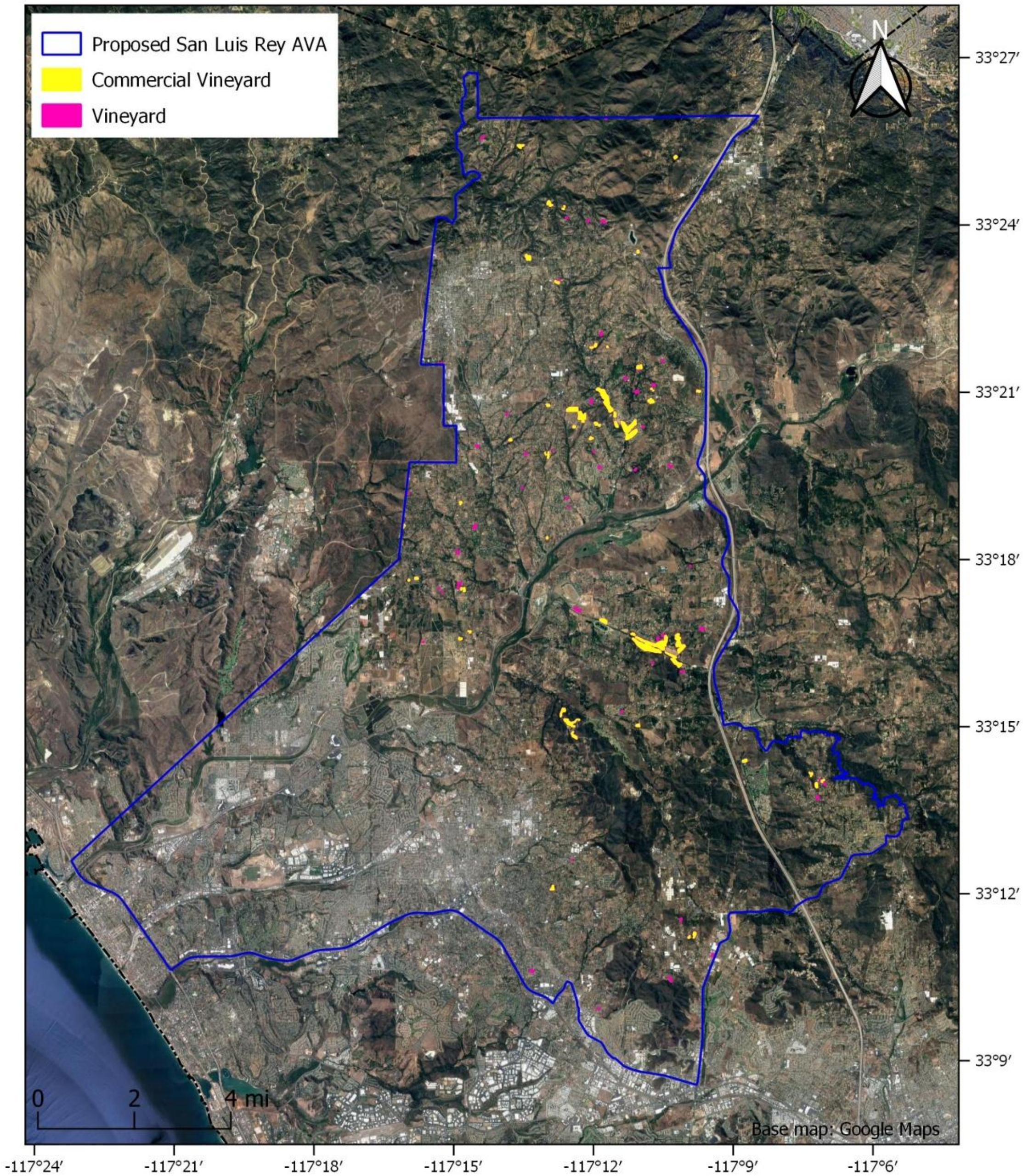


Figure 3. Map of existing vineyards within the proposed San Luis Rey AVA. Map author: Fallbrook Winery, 2020.

Table 3. Commercial Vineyards within the proposed San Luis Rey AVA

Owner	Winery	Acre
Moody Creek Farms, LLC		112.47
Jade Work, Monserate Winery		60.4
Premium Vintners, LLC	Fallbrook Winery	18.35
John and Terri Havens, Cal-a-Vie Health Spa		11.71
Vineyard at 1924		4.84
Adobe Hill Farms		3.63
Sunshine Mountain Vineyard, INC		2.79
Steve and Renee Tague		2.75
Mike Kisling		2.72
Marc and Jan Paquet		2.45
Sunrise Vineyard	Sunrise Vineyard	2.37
Myrtle Creek Vineyards LLC	Myrtle Creek Vineyards	2.18
Eric Brooking		2.16
Deer Park Escondido, LLC		1.92
Lionsgate Estate & Vineyard, LLC		1.64
James Harold & Judith Anne Brady	Roadrunner Ridge Winery	1.56
Beach House Winery, INC.		1.51
Steve Lane		1.34
Ed Lorentz		1.32
Broquer Vineyards	Broquer Vineyards	1.23
Bill Jackson		1.1
Shawn Weimer		1.07
Marcia Flowers	Toasted Oak Vineyards & Winery	1.03
Daniel Quinone		0.97
Sleeping Indian Vineyard		0.96
R.L. Trillium, LLC	Estate D'Iacobelli Winery	0.96
Keith McReynolds		0.95
Susan and Scott Peterson		0.89
Alliance International Trade & Investment Group, INC.	Blue-Merle Winery	0.88
Samuel D. & Leslie B. Oriza	Orizaba Winery	0.87
Jim Bulawa		0.85
Joe and Rebekah Worth		0.76
Hueftle INC	Hueftle Farm Vineyards	0.76
Coyote Oaks Vineyards, LLC		0.69
Judy Levin		0.63
Linda Ramm		0.61
Bryan Jones	Live Oak Vineyard	0.58
Kathy Barret		0.55
Mike and Susan Cobas		0.49
Eli Madyson Vineyards		0.47
Anne Watson		0.38
Romiglio Ridge L.L.C.	Romiglio Ridge Winery & Vineyards	0.28

Exhibit D. Map of proposed San Luis Rey AVA and watersheds

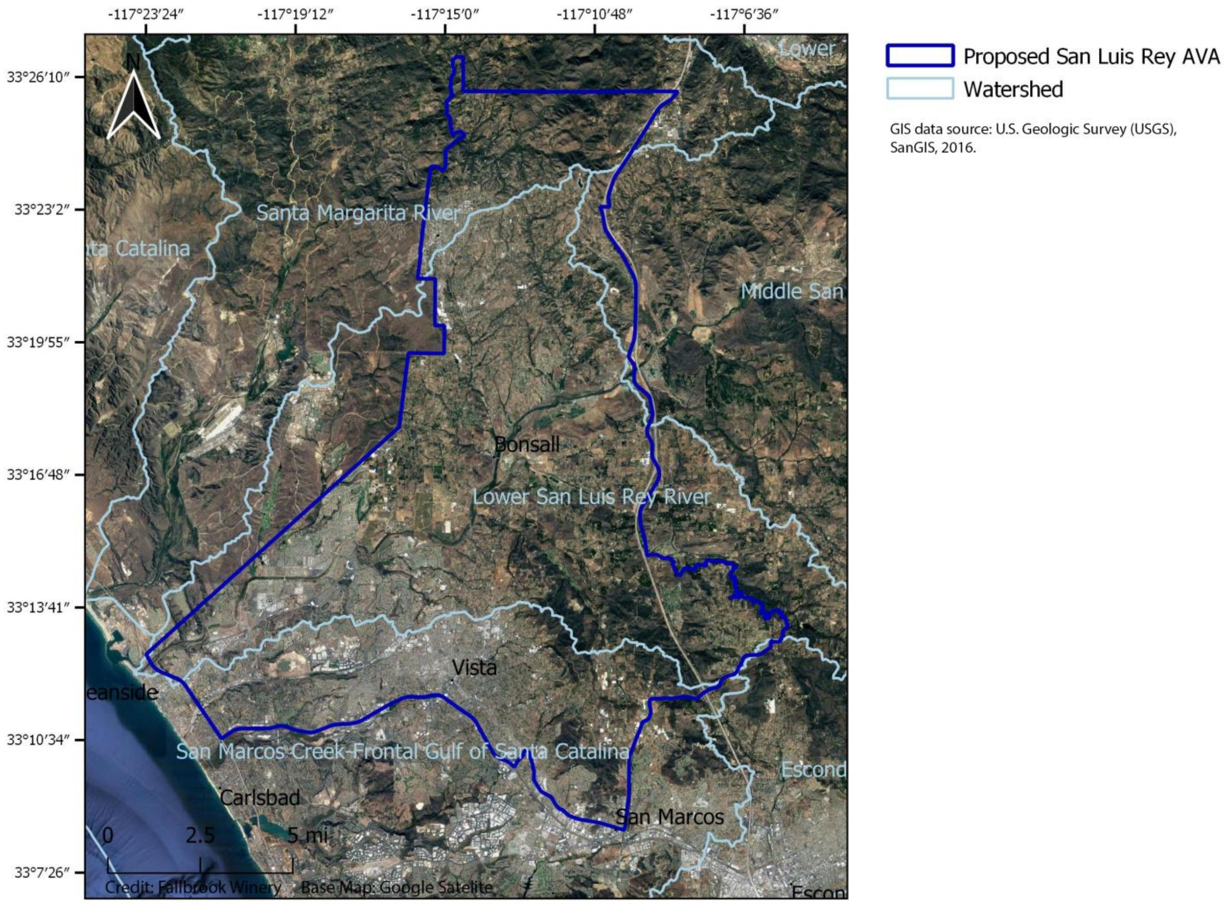


Figure 4. Map of proposed San Luis Rey AVA and watersheds.

Exhibit E. Evidence of the use and recognition of the name San Luis Rey

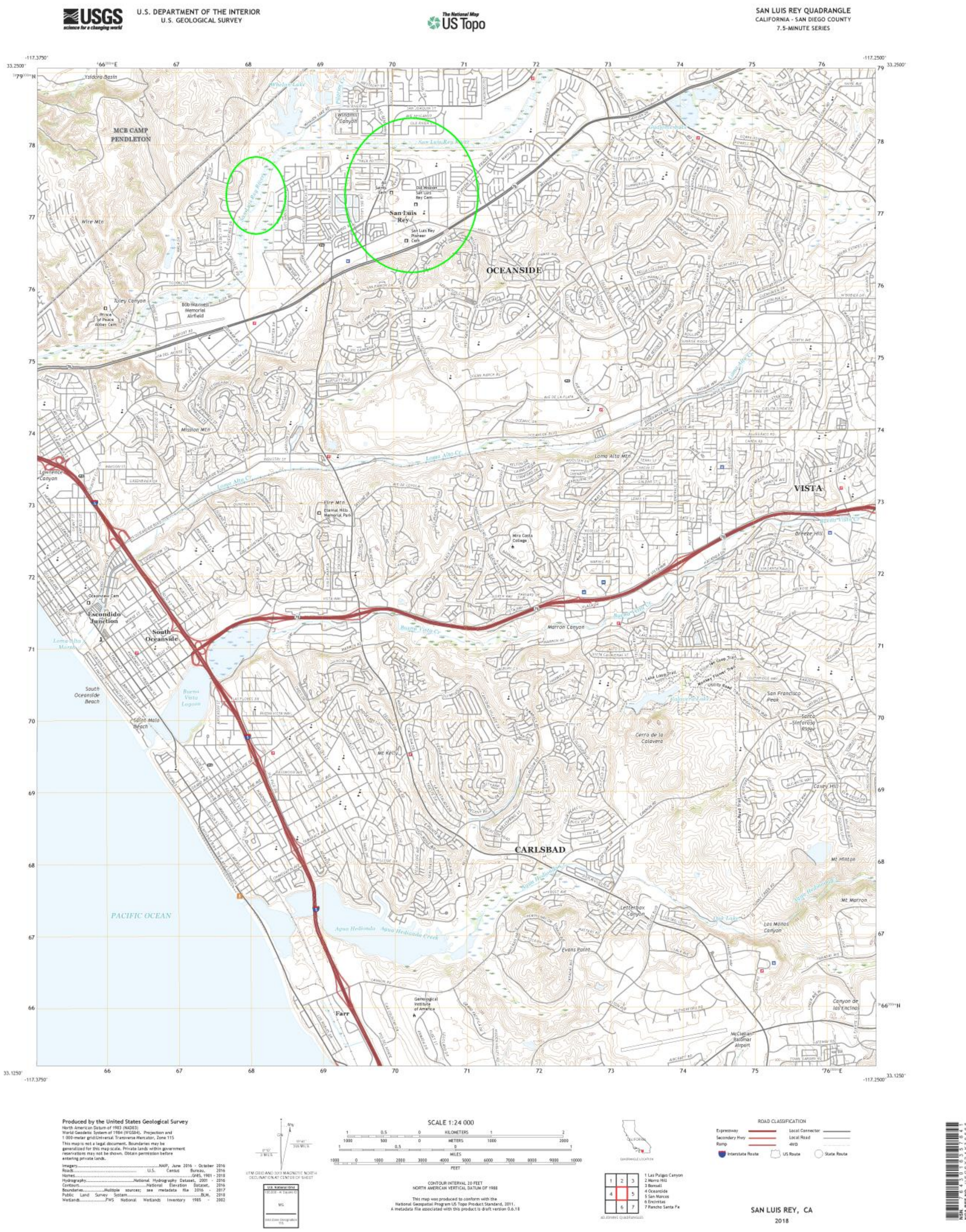


Figure 5. Evidence of the use and recognition of the name San Luis Rey: USGS topographical map of San Luis Rey Quadrangle showing San Luis Rey River, San Luis Rey neighborhood and Old Mission San Luis Rey

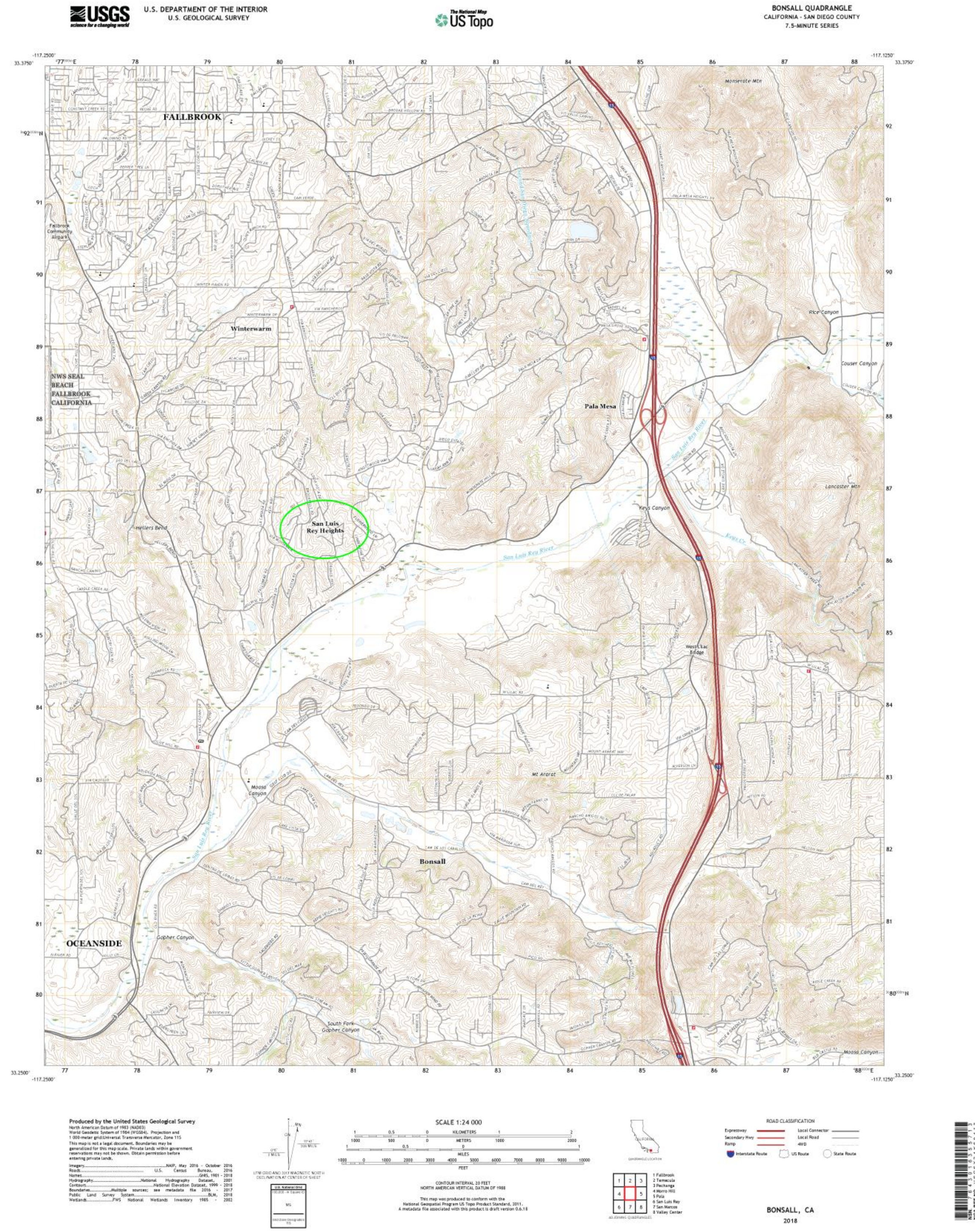


Figure 6. Evidence of the use and recognition of the name San Luis Rey: USGS topographical map of Bonsall Quadrangle showing a geographical name San Luis Heights

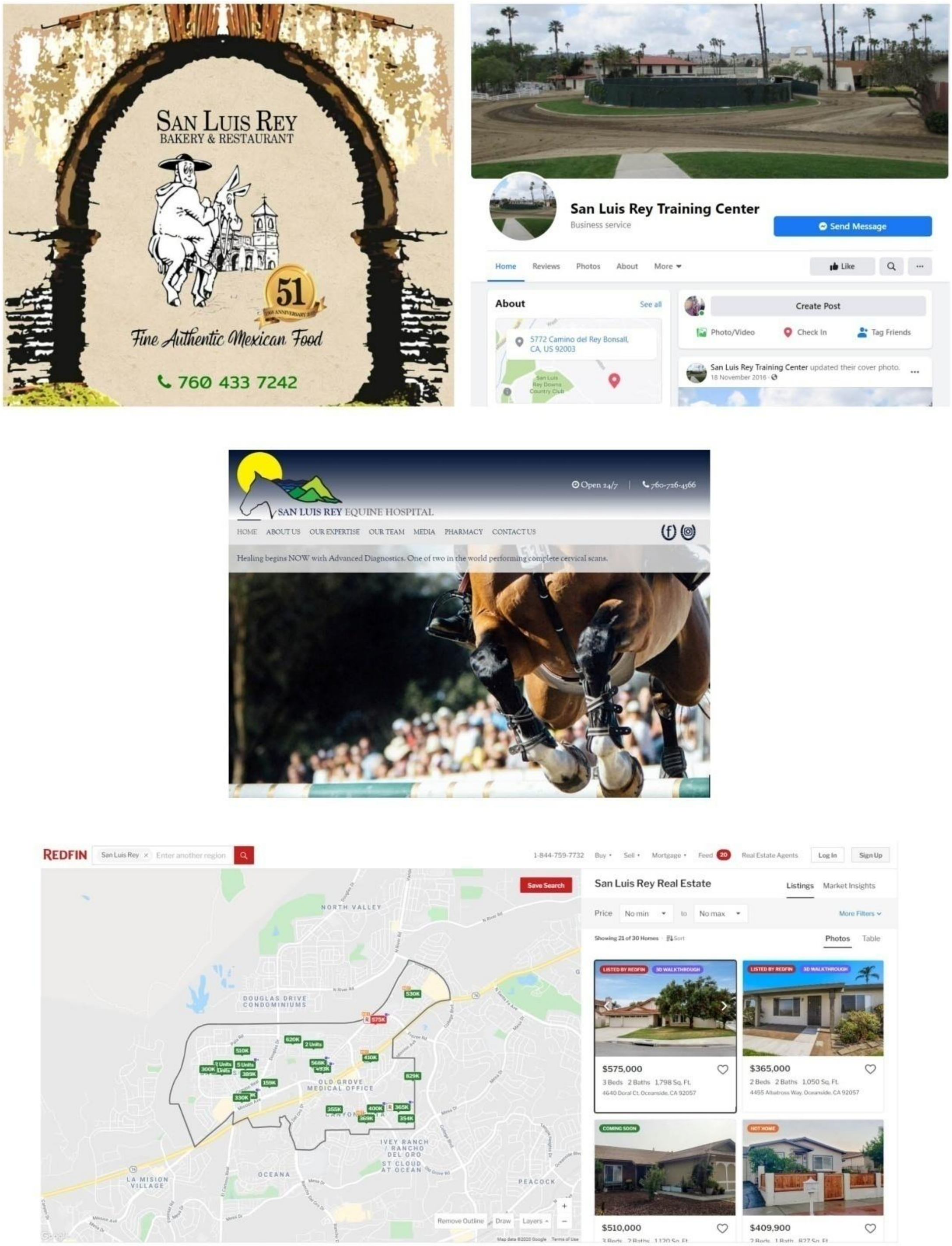


Figure 7. Evidence of the use and recognition of the name San Luis Rey: Business names incorporating San Luis Rey and real estate featuring San Luis Rey neighborhood properties, all located within the proposed San Luis Rey AVA.

Exhibit F. USGS topo maps with delineated boundary of the proposed San Luis Rey AVA

Exhibit G. Average Number of Frost Days in the proposed San Luis Rey AVA

Table 4. Average Number of Frost Days in the proposed San Luis Rey AVA

	Long-term average number of days per month where minimum temperature is less than or equal to 32F (30 year normal 1981 – 2010)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
OCEANSIDE MUNICIPAL AIRPORT, CA	2.4	0.3	0	0	0	0	0	0	0	0	0.3	1.7
VISTA, CA	0.3	0.1	0.1	<0.1	0	0	0	0	0	0	0	0.2

Data Source: (NOAA, National Centers for Environmental Information, 2010)

Exhibit H. Average annual mean temperature across South Coast AVA (30 year normal 1981-2010)

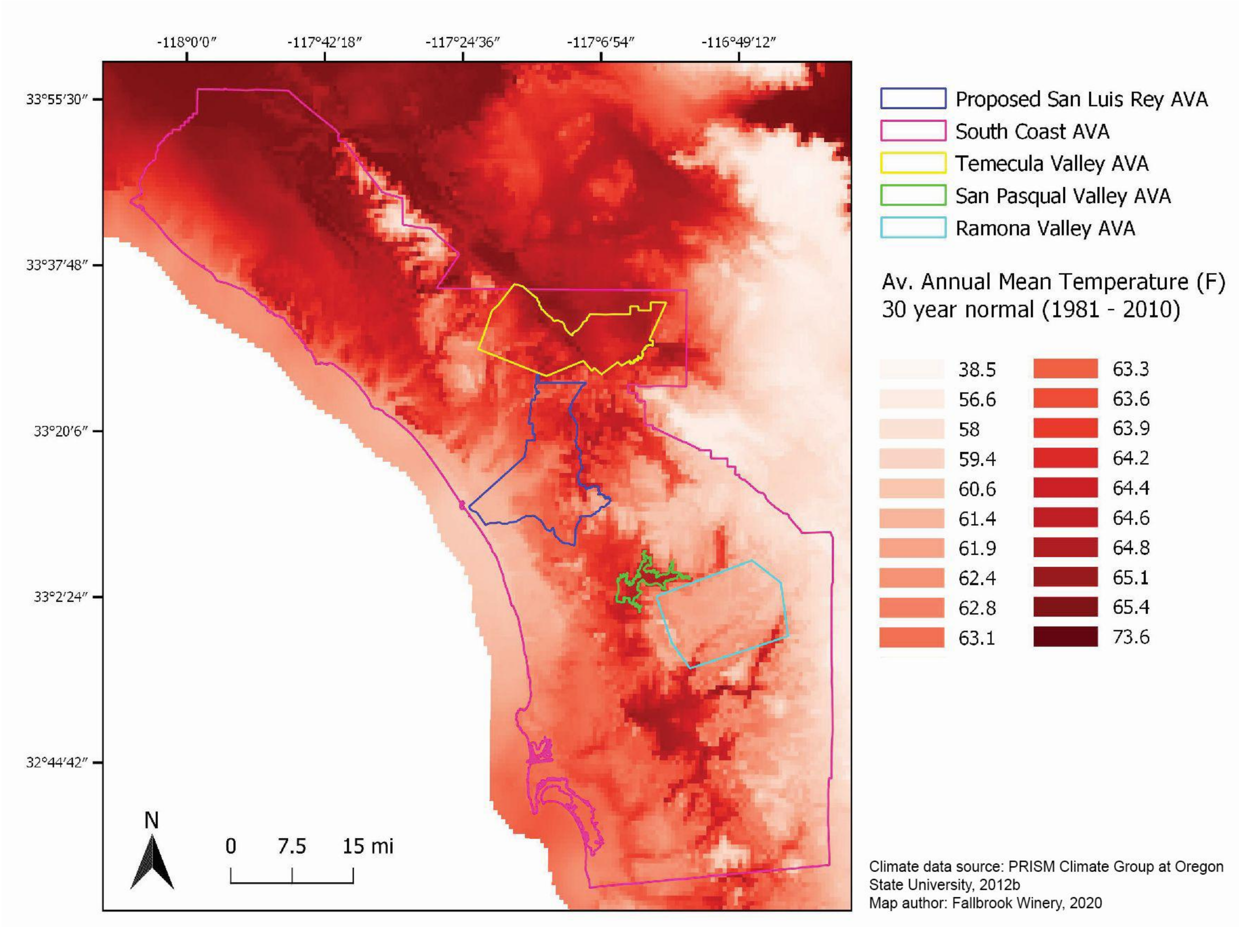


Figure 8. Map of average annual mean temperature (30 year normal 1981-2010) with South Coast AVA, Temeculla Valley AVA, San Pasqual Valley AVA and Ramona Valley AVA

Table 5. Raster statistics for 30 year average annual temperature (30 year normal, 1981 – 2010)

AREA	Mean (°F)	Std. Dev. (°F)
South Coast AVA	63.11	1.60
Proposed San Luis Rey AVA	63.11	0.90
Temecula Valley AVA	64.39	0.48
San Pasqual Valley AVA	64.55	0.24
Ramona Valley AVA	61.91	0.65

Average annual mean temperature data from PRISM Climate Group at Oregon State was extracted, processed and analyzed as described in Appendix 1, section Average Annual Mean Temperature.

Exhibit I. Average annual maximum temperature across South Coast AVA (30 year normal 1981-2010)

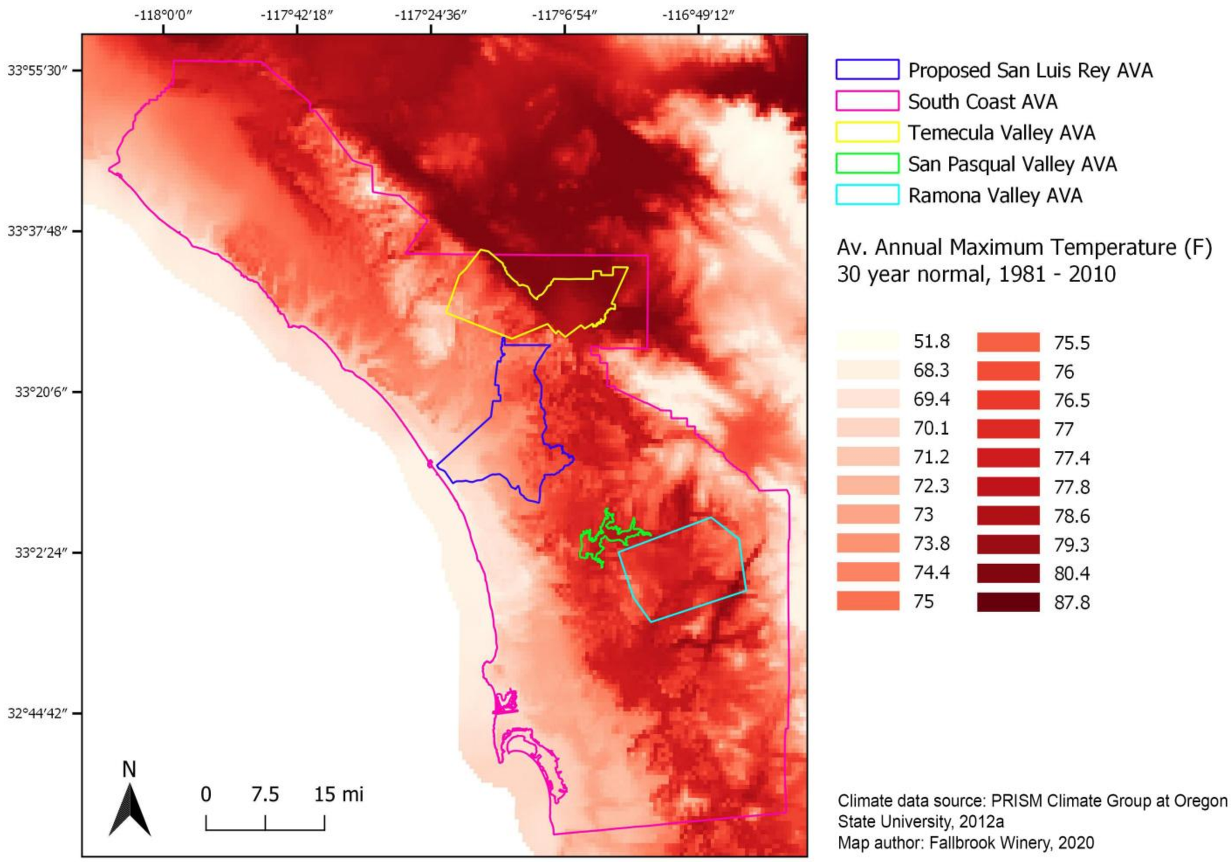


Figure 9. Map of average annual maximum temperature (30 year normal 1981-2010) with South Coast AVA, Temecula Valley AVA, San Pasqual Valley AVA and Ramona Valley AVA

Table 6. Raster statistic for 30 year average annual maximum temperature (30 year normal, 1981 – 2010):

AREA	Mean (°F)	Std. Dev. (°F)
South Coast AVA	74.99	2.52
Proposed San Luis Rey AVA	74.20	1.80
Temecula Valley AVA	77.65	2.14
San Pasqual Valley AVA	77.75	0.56
Ramona Valley AVA	76.76	0.98

Average annual maximum temperature data from PRISM Climate Group at Oregon State was extracted, processed and analyzed as described in Appendix 1, section Average Annual Maximum Temperature.

Exhibit J. Average July, August, September and October maximum temperature across South Coast AVA (30 year normal 1981-2010)

Table 7. Raster statistic of average July, August, September and October maximum temperature (30 year normal, 1981 – 2010)

	Mean Maximum Temperature (° F) within the area			
AREA	July	August	September	October
South Coast AVA	85.90	87.28	84.90	78.89
Proposed San Luis Rey AVA	82.89	84.22	82.78	78.24
Temecula Valley AVA	93.46	94.50	88.18	80.53
San Pasqual Valley AVA	88.25	89.62	87.42	82.39
Ramona Valley AVA	90.66	92.02	88.90	80.72

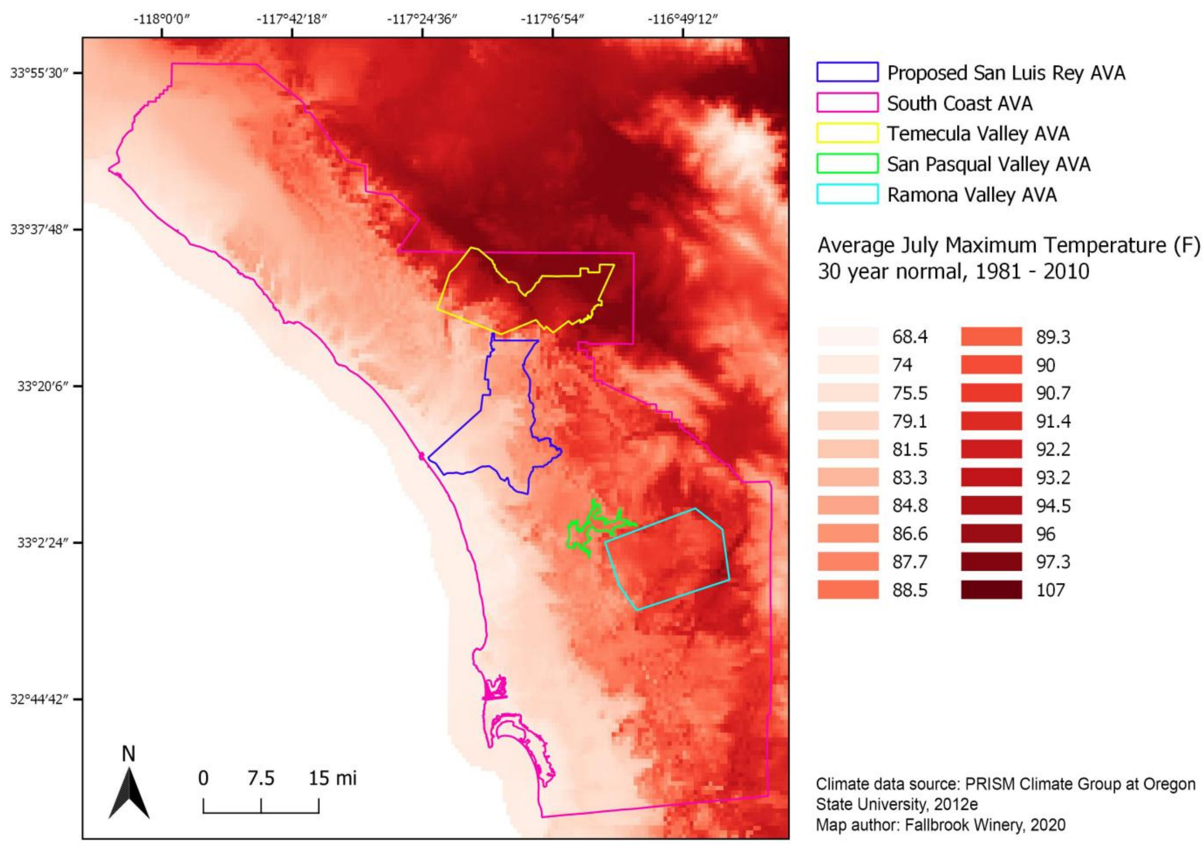


Figure 10. Average July maximum temperature (°F) across South Coast AVA (30 year normal 1981-2010)

Average July maximum temperature data from PRISM Climate Group at Oregon (PRISM Climate Group at Oregon State University, 2012e)was extracted, processed and analyzed as described in Appendix 1, section Average July Maximum Temperature.

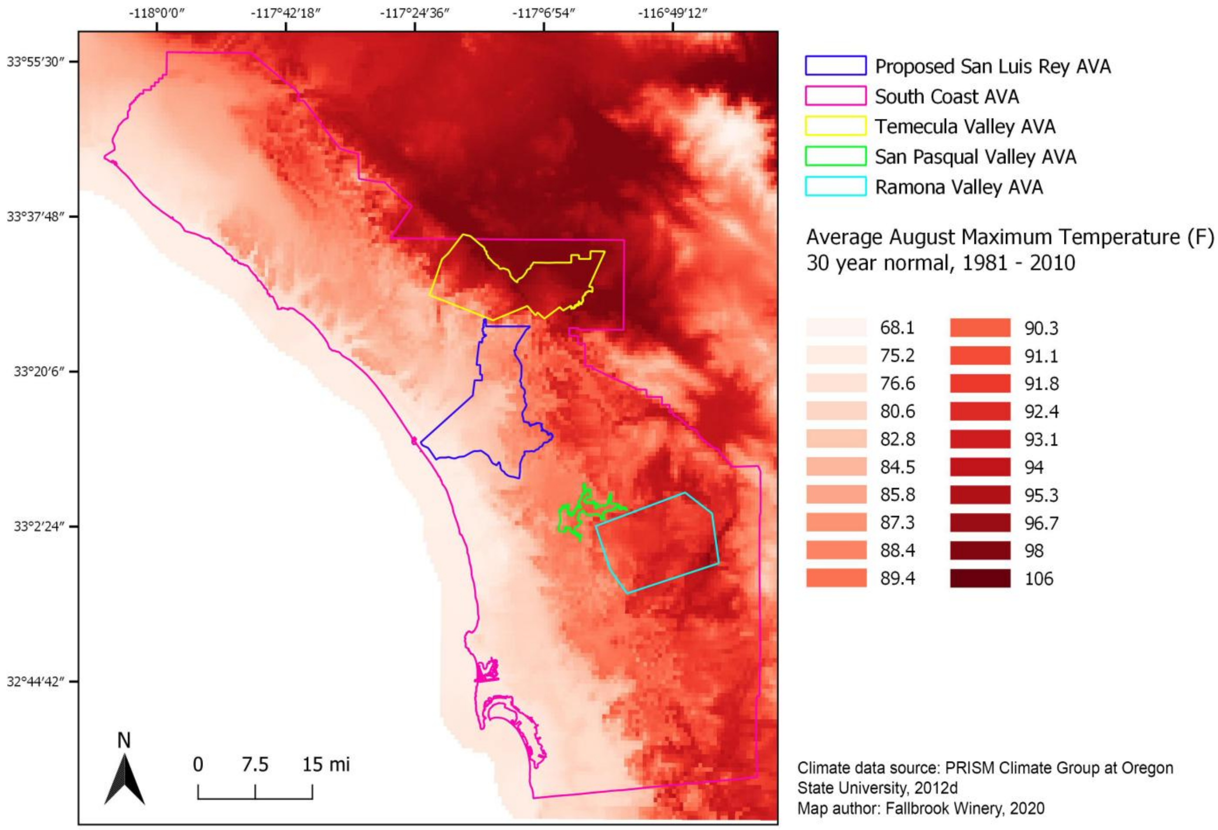


Figure 11. Average August maximum temperature (°F) across South Coast AVA (30 year normal 1981-2010)

Average August maximum temperature data from PRISM Climate Group at Oregon State (PRISM Climate Group at Oregon State University, 2012d)was extracted, processed and analyzed as described in Appendix 1, section Average August Maximum Temperature.

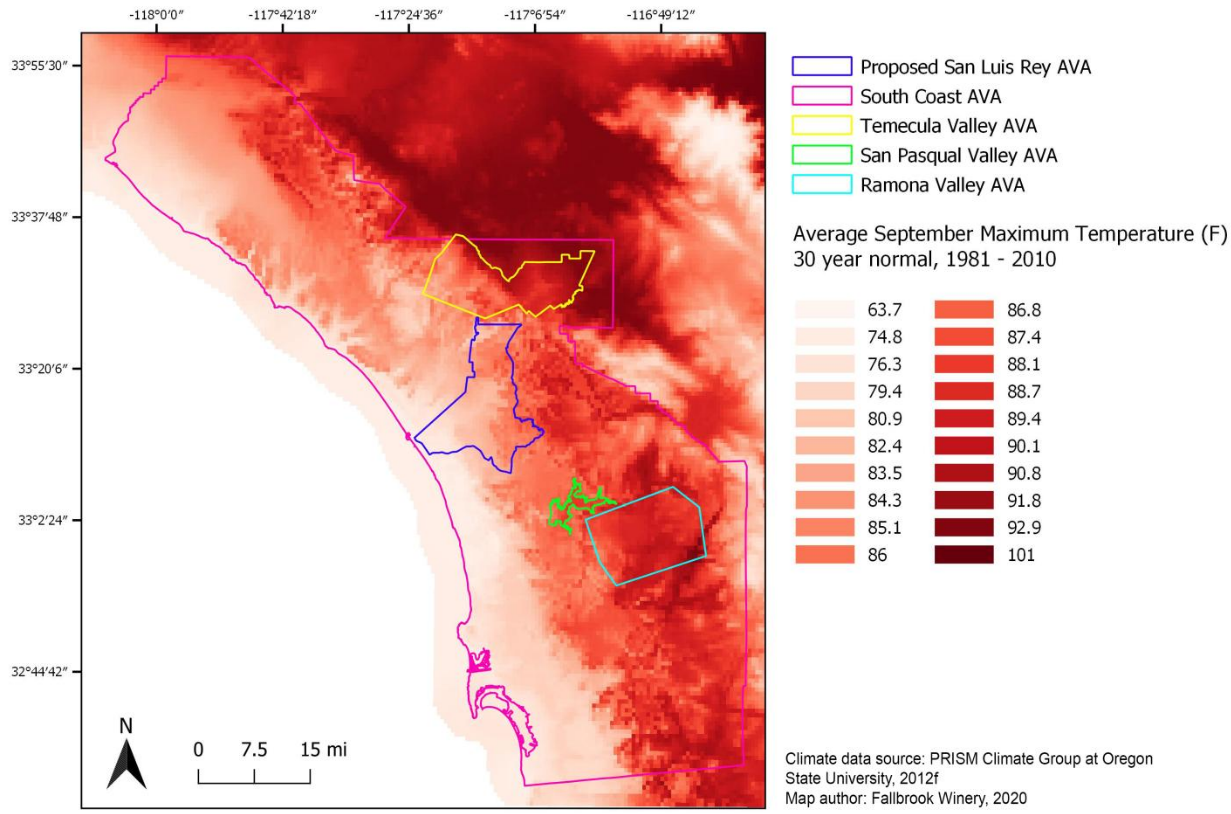


Figure 12. Average September maximum temperature (°F) across South Coast AVA (30 year normal 1981-2010)

Average September maximum temperature data from PRISM Climate Group at Oregon (PRISM Climate Group at Oregon State University, 2012f) was extracted, processed and analyzed as described in Appendix 1, section Average September Maximum Temperature.

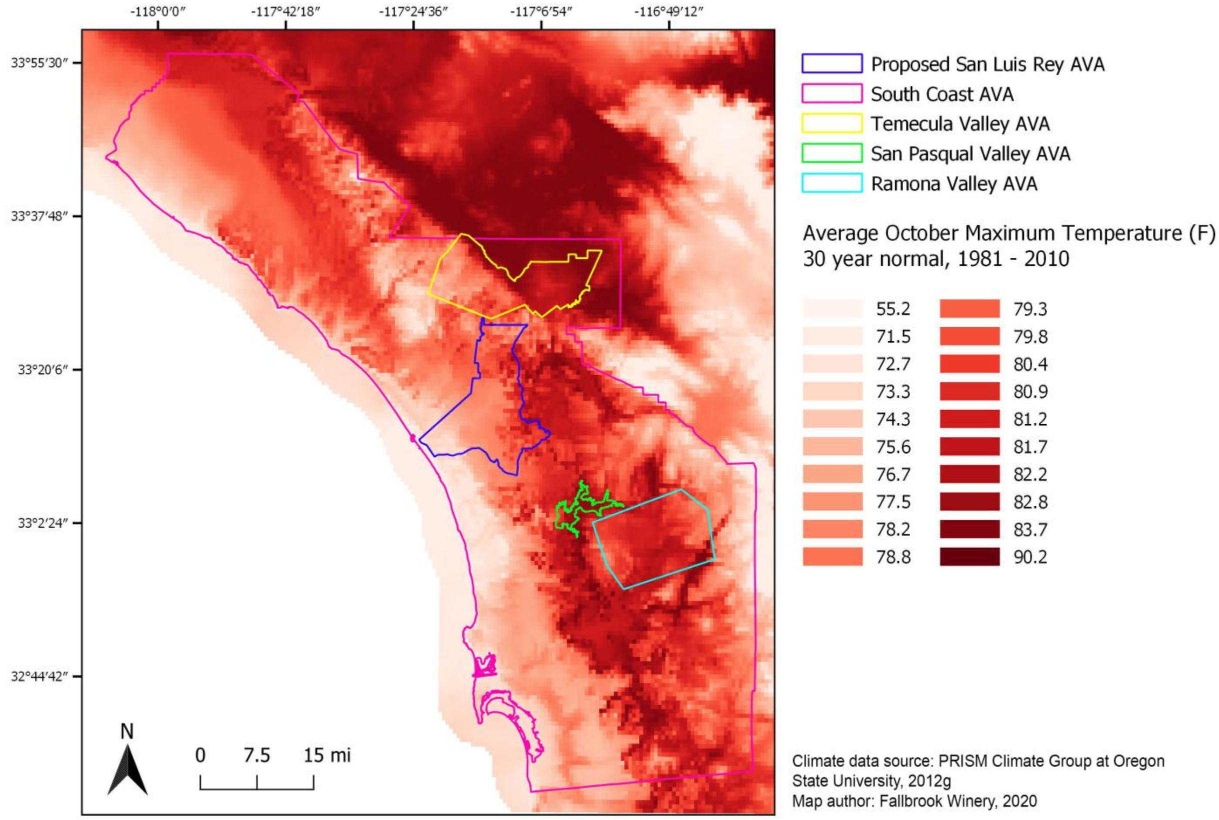


Figure 13. Average October maximum temperature (°F) across South Coast AVA (30 year normal 1981-2010)

Average October maximum temperature data from PRISM Climate Group at Oregon (PRISM Climate Group at Oregon State University, 2012g) was extracted, processed and analyzed as described in Appendix 1, section Average October Maximum Temperature.

Exhibit K. Diurnal Temperature Variation

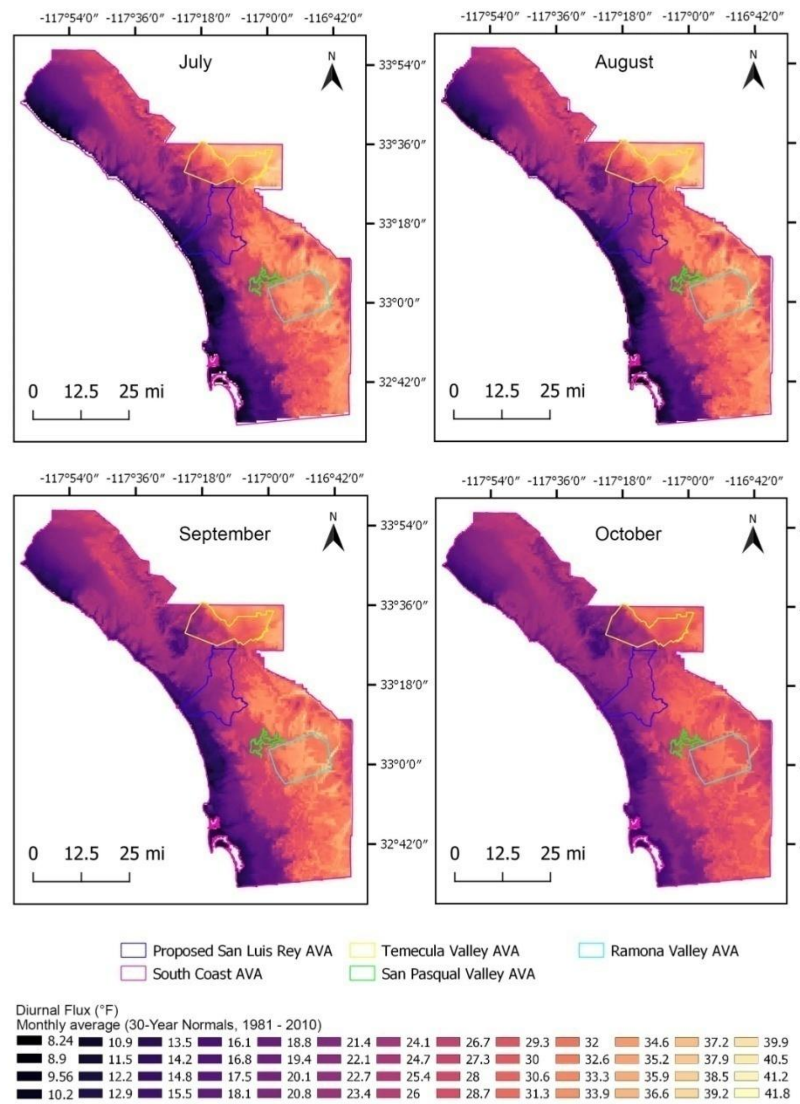


Figure 14. Daily temperature variation, monthly average (30 year normal 1981 – 2010); data source: PRISM Climate Group at Oregon State University, 2012d; PRISM Climate Group at Oregon State University, 2012i; PRISM Climate Group at Oregon State University, 2012e; PRISM Climate Group at Oregon State University, 2012h; PRISM Climate Group at Oregon State University, 2012g; PRISM Climate Group at Oregon State University, 2012k; PRISM Climate Group at Oregon State University, 2012f; PRISM Climate Group at Oregon State University, 2012j. Map author: Fallbrook Winery 2020. Map author: Fallbrook Winery;

Average monthly minimum and maximum temperature data from PRISM Climate Group at Oregon State University was extracted, processed and analyzed as described in Appendix 1, section Daily Temperature Variation, Monthly Average.

Table 8. Daily temperature variation, monthly average, 30 year normal (1981 - 2010)

	Mean cell value of diurnal temperature variation for the area (°F)			
	July	August	September	October
South Coast AVA	25.4	25.6	25.4	24.8
Proposed San Luis Rey AVA	21.9	22.5	23.0	23.4
Temecula Valley AVA	32.2	32.5	28.3	26.3
San Pasqual Valley AVA	27.1	27.6	27.6	28.5
Ramona Valley AVA	33.6	33.8	33.5	31.0

Exhibit L. Growing Degree Days

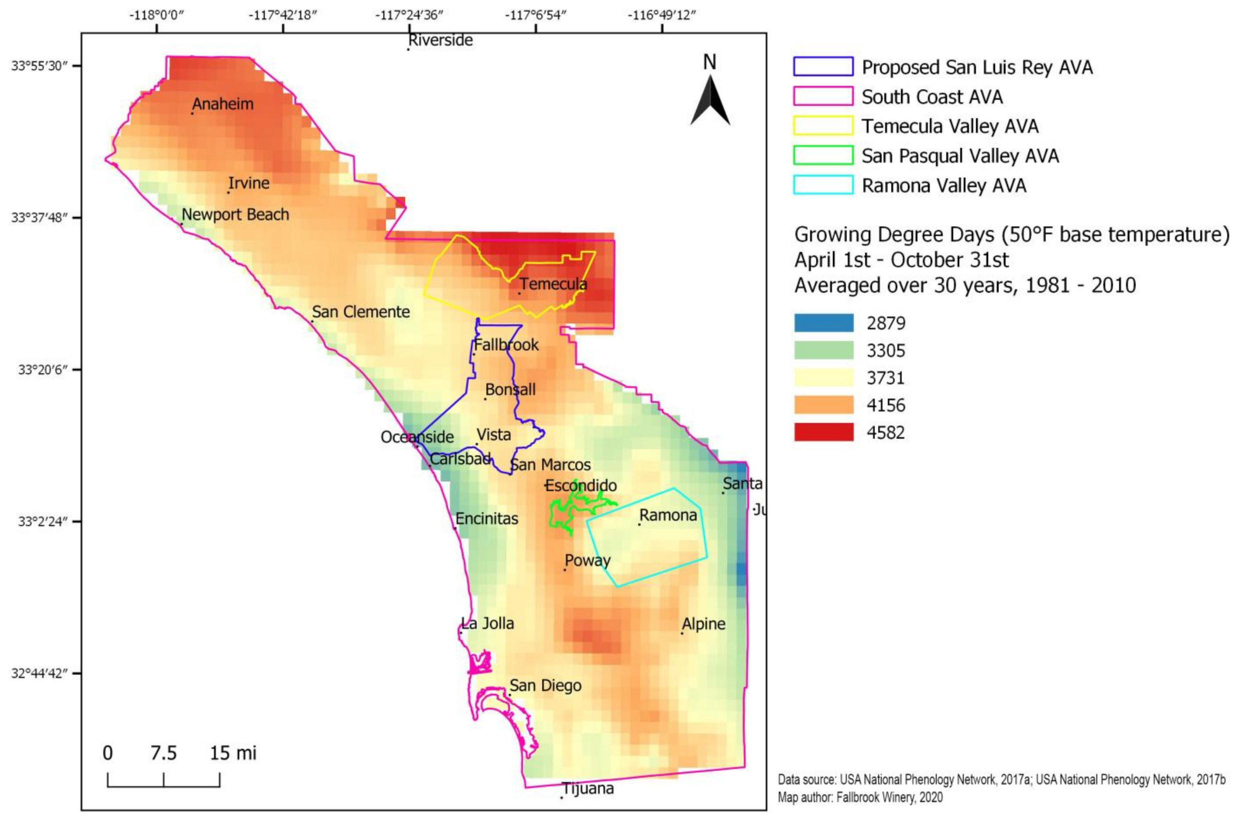


Figure 15. Map of Growing Degree Days (April 1st to October 31st) across South Coast AVA, data averaged for the period 1981 - 2010.

Table 9. Raster statistic for 30 year average of Growin Degree Days (GDD)

AVA	Min GDD	Max GDD	Mean GDD	Std. Dev.
South Coast AVA	2879	4582	3907	298
Proposed San Luis Rey AVA	3250	4139	3849	194
Temecula Valley AVA	3844	4537	4218	183
San Pasqual Valley AVA	3946	4234	4122	99
Ramona Valley AVA	3570	3938	3740	94

Average Degree Days data (USA National Phenology Network, 2017a; USA National Phenology Network, 2017b) was extracted, processed and analyzed as described in Appendix 1, section Growing Degree Days.

Exhibit M. Precipitation

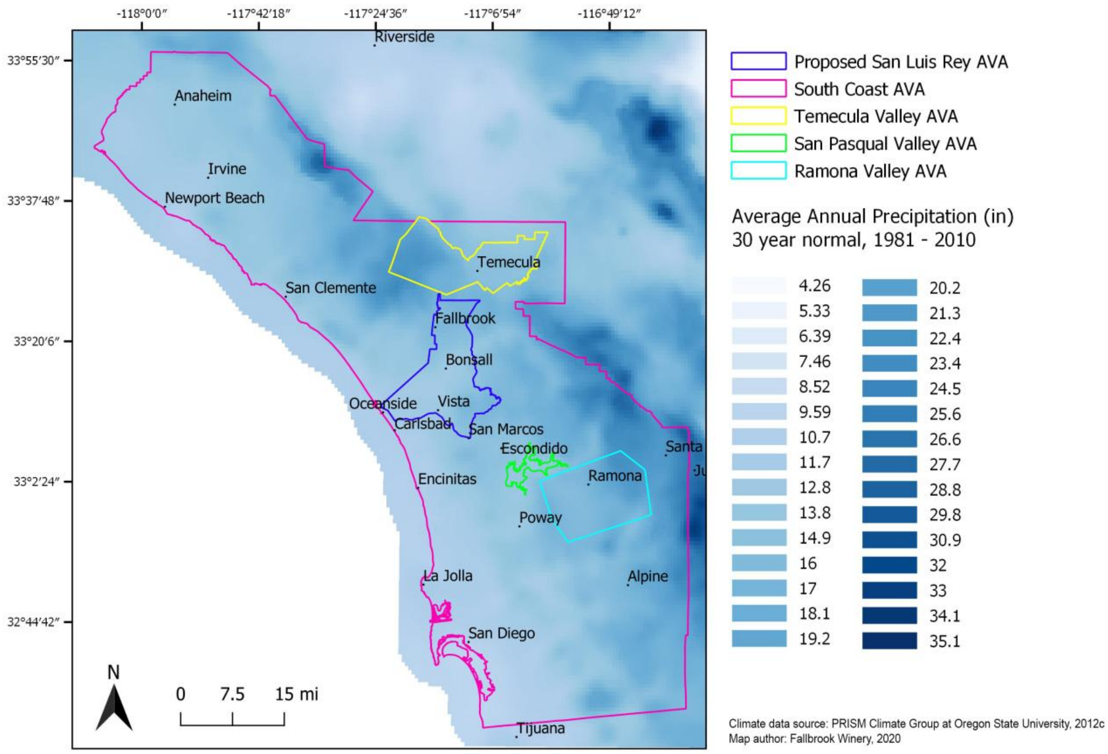


Figure 16. Average annual precipitation (in) across South Coast AVA (30 year normal 1981-2010)

Table 10. Raster statistics of long-term average annual precipitation (30 year normal, 1981 – 2010)

	Max (in)	Mean (in)	Min (in)	Std. Dev. (in)
South Coast AVA	29.33	15.56	9.34	3.40
Proposed San Luis Rey AVA	16.97	14.27	11.48	1.61
Temecula Valley AVA	22.58	17.34	13.51	2.69
San Pasqual Valley AVA	14.79	13.69	13.30	0.26
Ramona Valley AVA	22.86	17.87	15.34	2.05

Precipitation data was extracted, processed and analyzed as described in Appendix 1, section Average Annual Precipitation.

Exhibit N. Coastal low cloud over Western Coast of United States, May - September

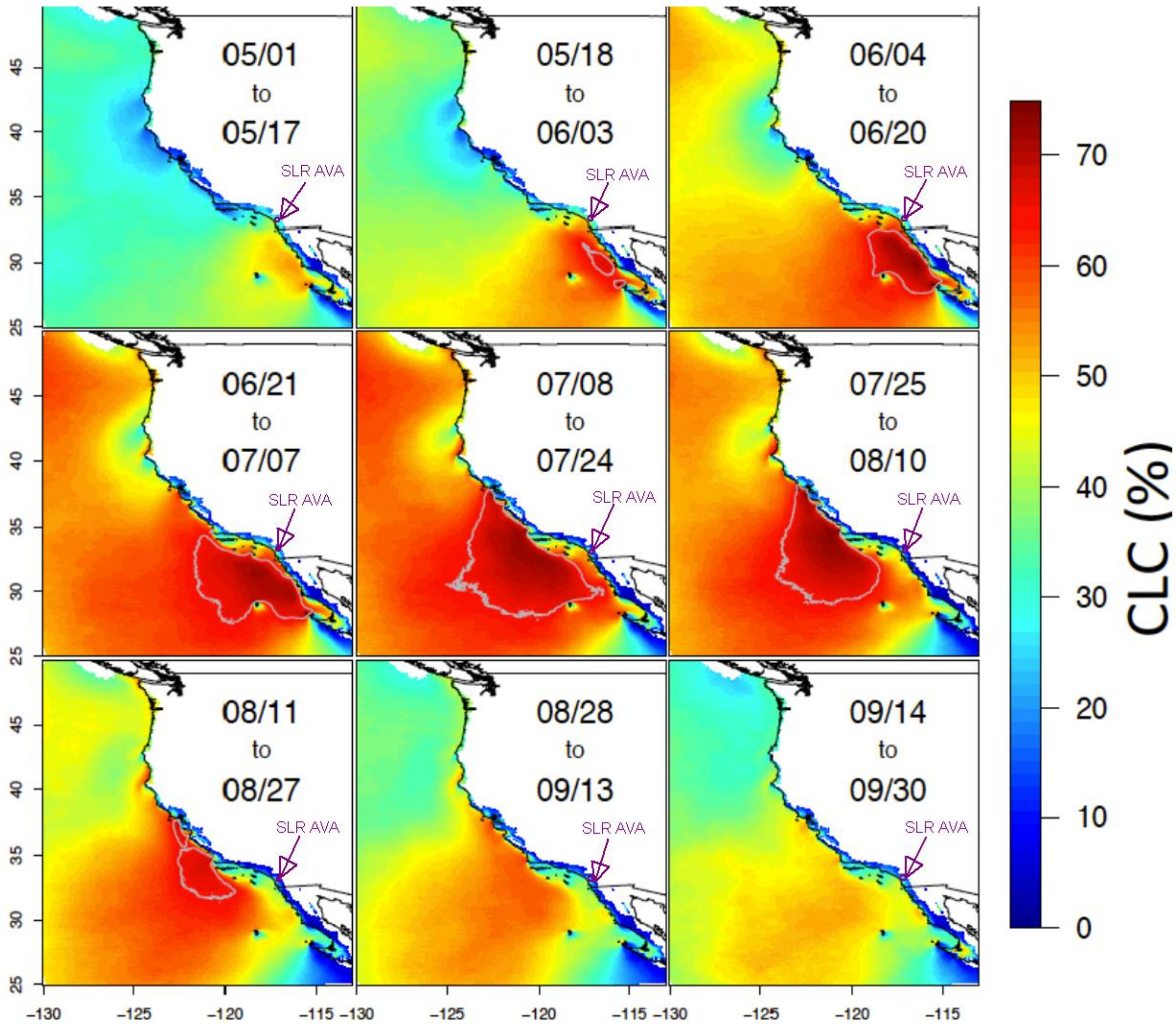


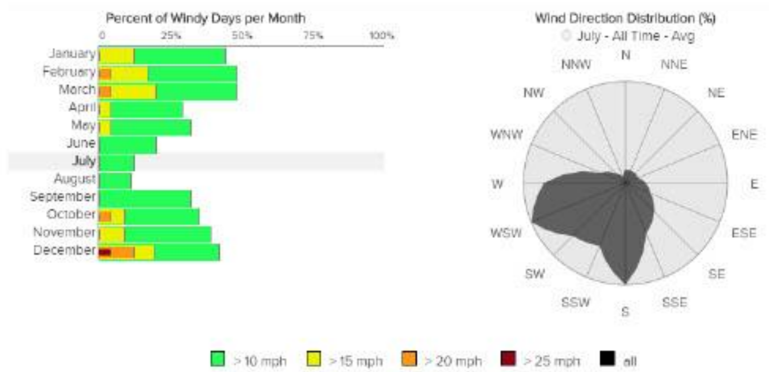
Figure 17. 17-day averages of coastal low cloud seasonal cycle over western coast of United States. Gray contour denotes 65% coastal low cloud. In this image coastal low cloud is quantified daily as the percent of time low cloud was present relative to the number of corresponding valid observations in a 24-hour day(Schwartz, 2015).

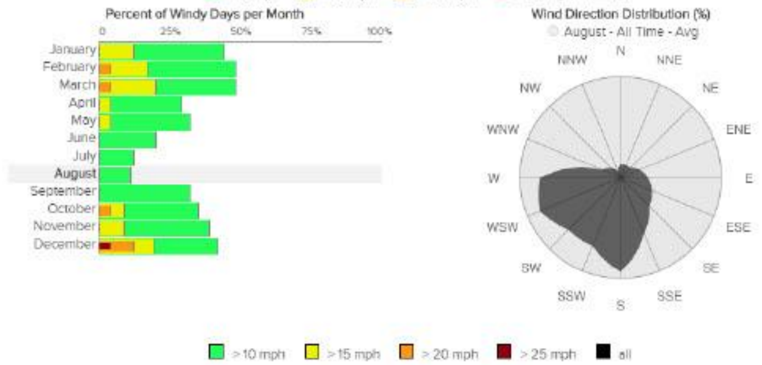
Exhibit O. Wind speed and direction in the proposed San Luis Rey AVA

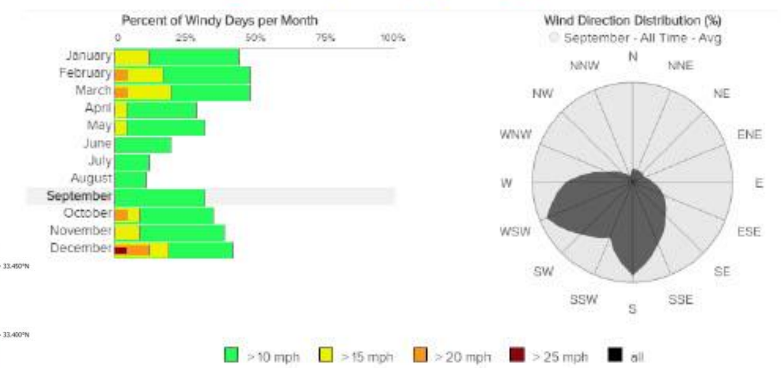
Red Mountain CA US HPWREN
All Time Average, data from
08/21/2013 to 03/13/2020

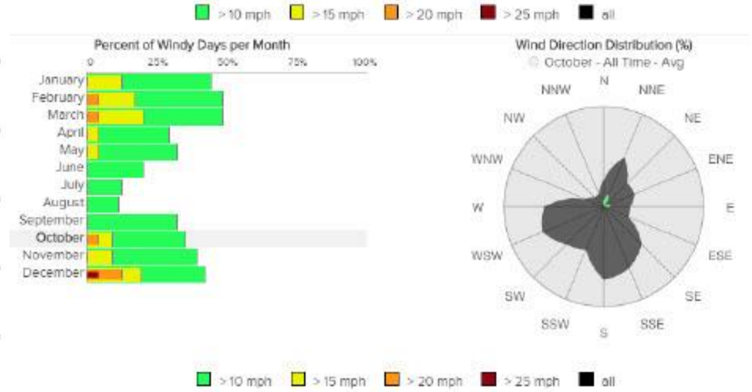
Credit: WeatherFlow Inc. (2020). Map. Retrieved March 14, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

WeatherFlow Inc. is not a party to this petition, but rather a data provider who neither supports nor opposes the petition.









KL18 (Fallbrook Airpark)
All Time Average, data from 10/14/2014 to 03/14/2020

Credit: WeatherFlow Inc. (2020). Map. Retrieved March 14, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

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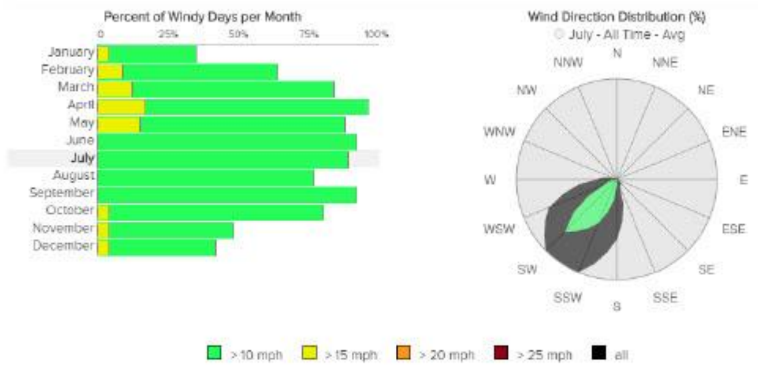
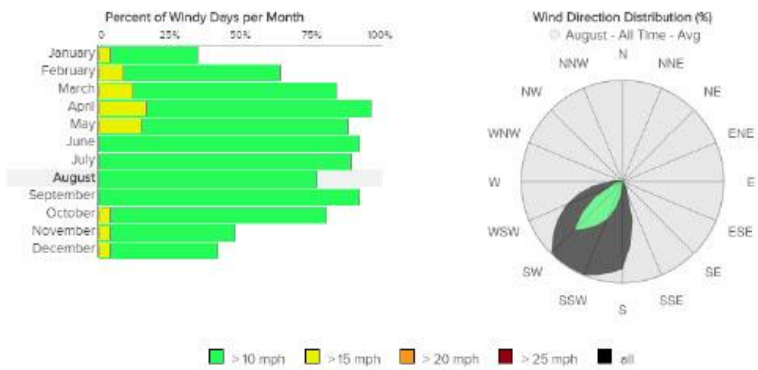
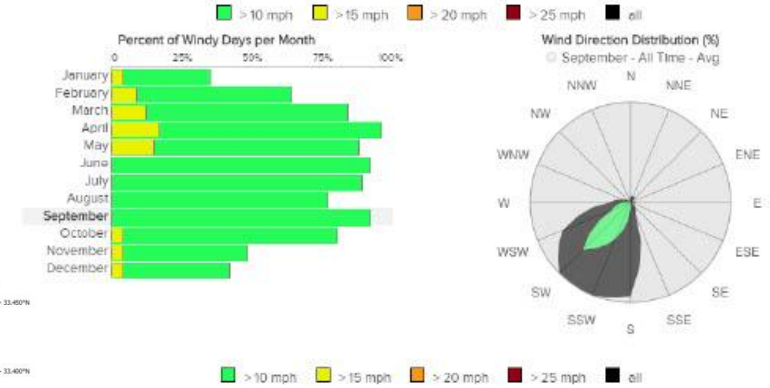
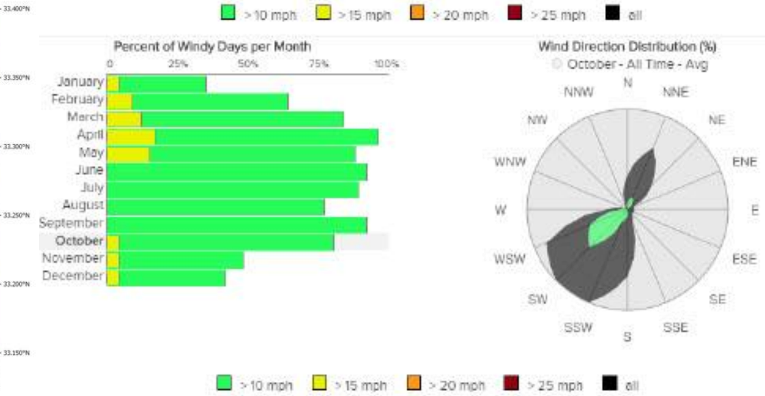




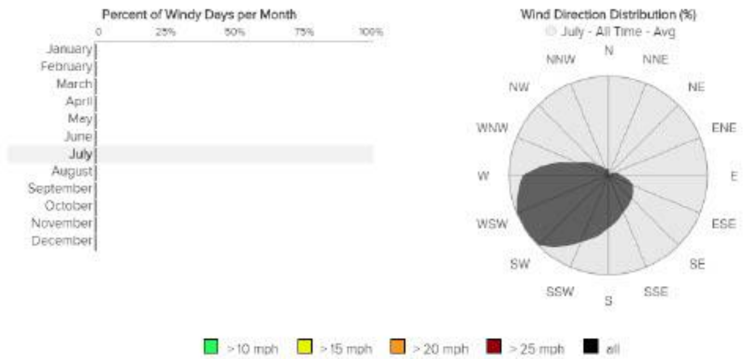


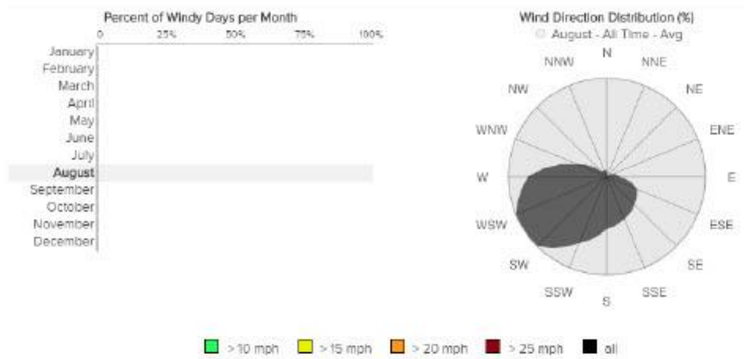


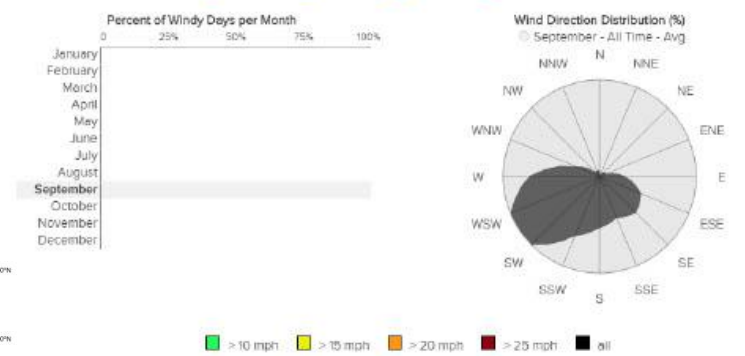
EW8406 Fallbrook CA US
All Time Average, data from 01/13/2016 to 03/25/2020

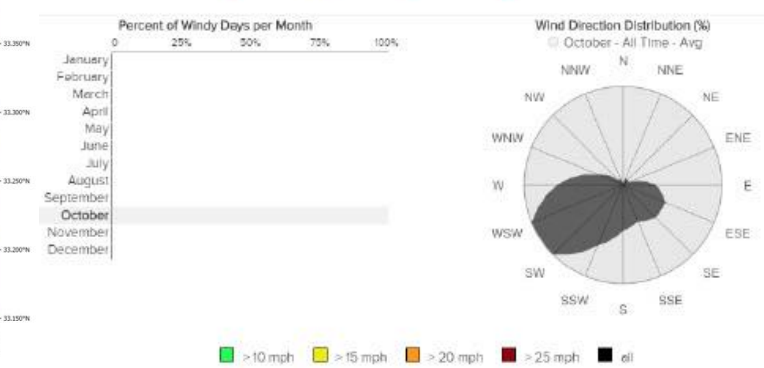
Credit: WeatherFlow Inc. (2020). Map. Retrieved March 25, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

WeatherFlow Inc. is not a party to this petition, but rather a data provider who neither supports nor opposes the petition.









Fallbrook
All Time Average, data from 09/10/2010 to 03/25/2020

Credit: WeatherFlow Inc. (2020). Map. Retrieved March 14, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

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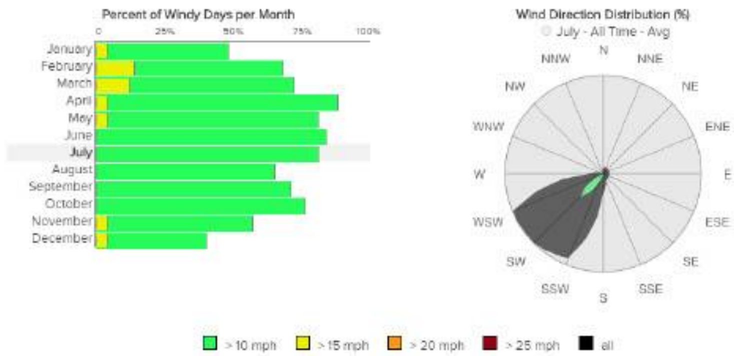

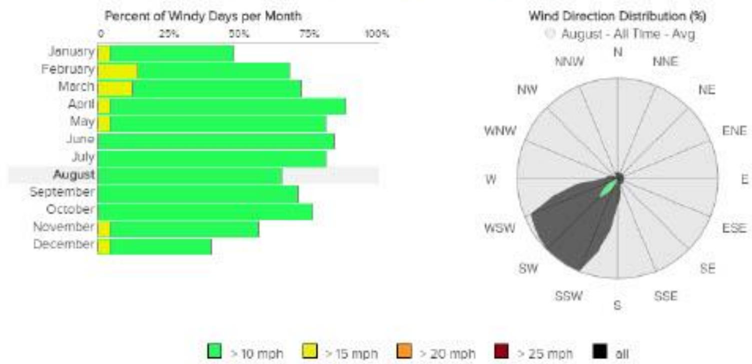

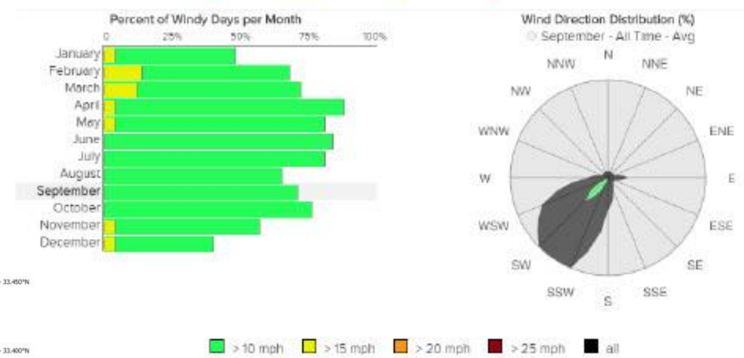

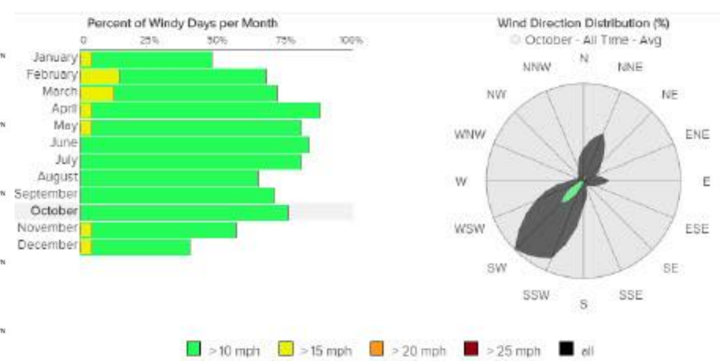

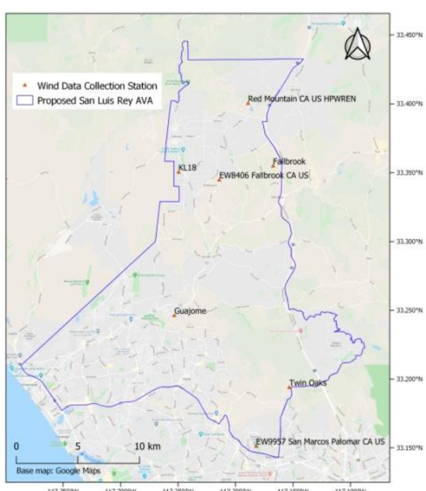

Guajome
All Time Average, data from 02/05/2009 to 03/14/2020

Credit: WeatherFlow Inc. (2020). Map. Retrieved March 14, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

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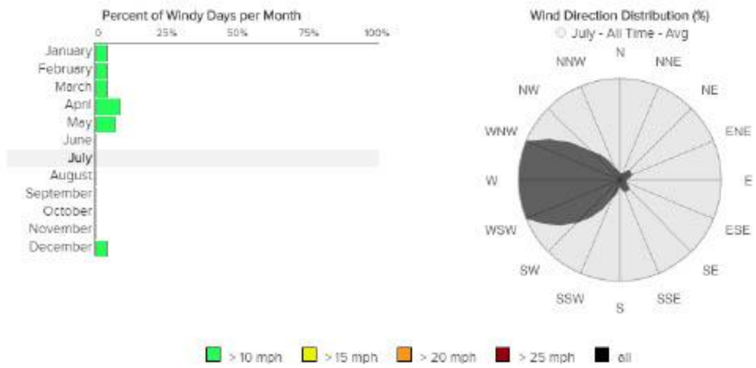

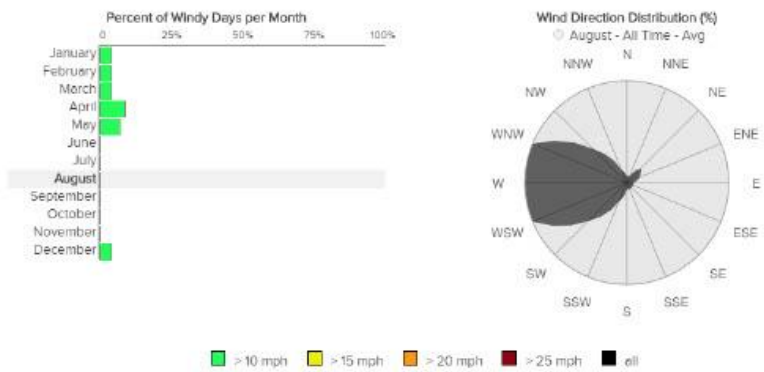

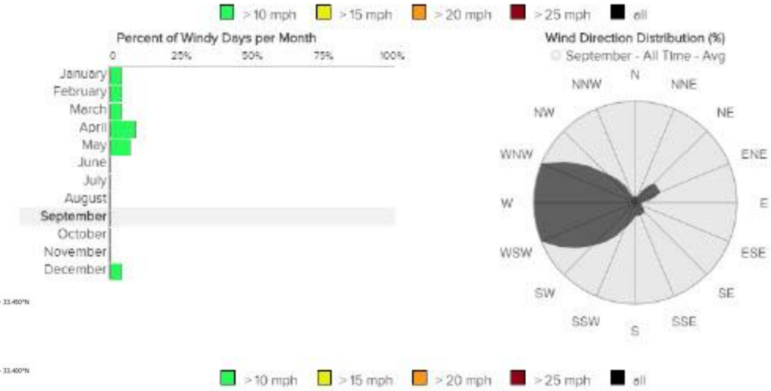

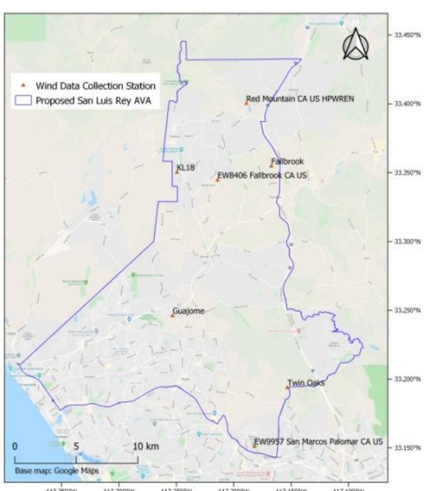

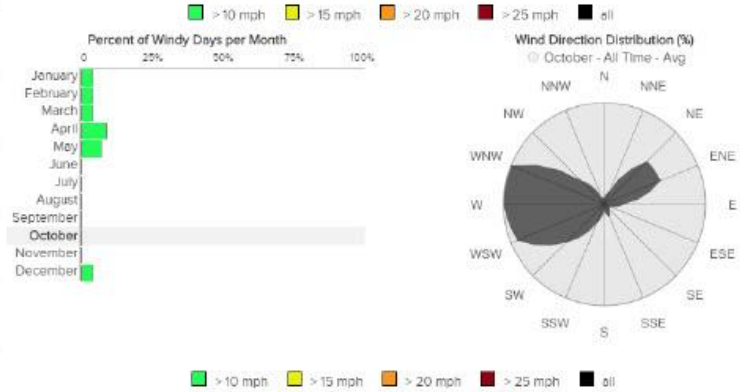

Twin Oaks
All Time Average, data from 09/01/2010 to 03/14/2020

Credit: WeatherFlow Inc. (2020). Map. Retrieved March 14, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

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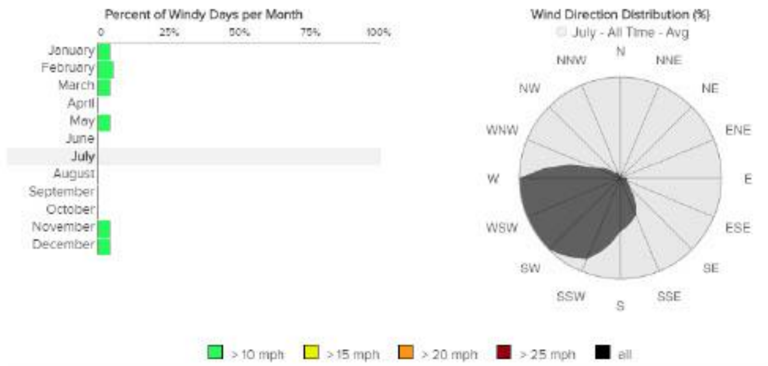

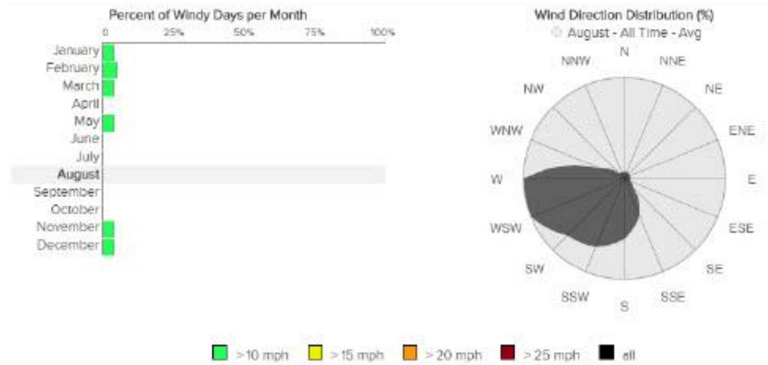

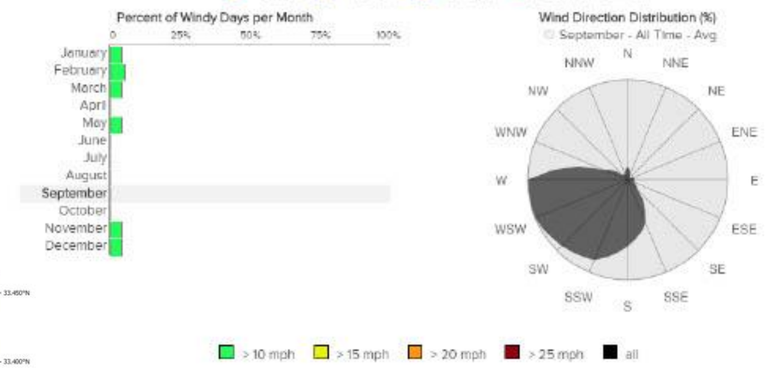

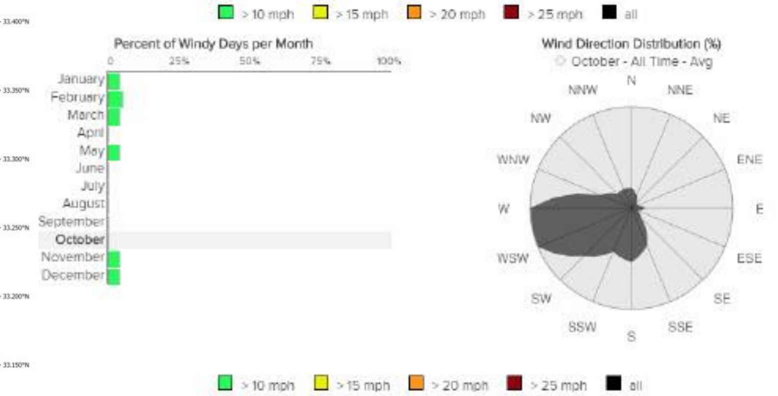

EW9957 San Marcos
Palomar CA US
All Time Average, data from 11/09/2016 to 03/14/2020

Credit: WeatherFlow Inc. (2020). Map. Retrieved March 14, 2020, from WindAlert: https://windalert.com/map#33.324,-117.231,11,239775

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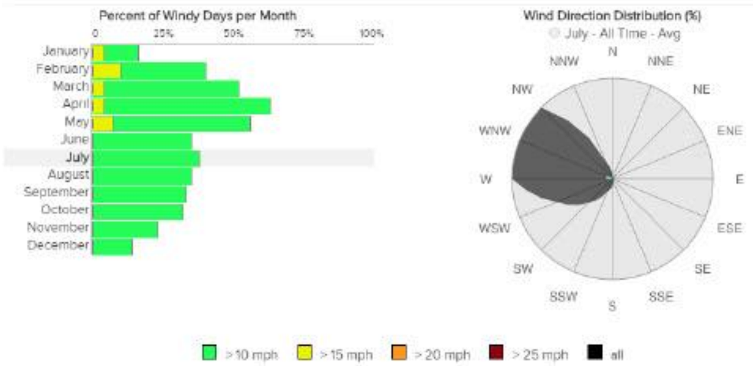
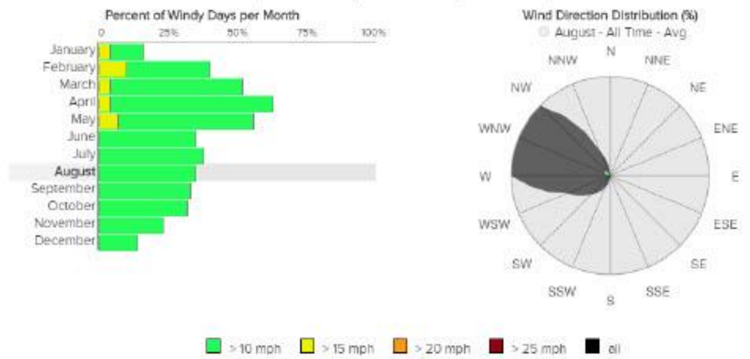
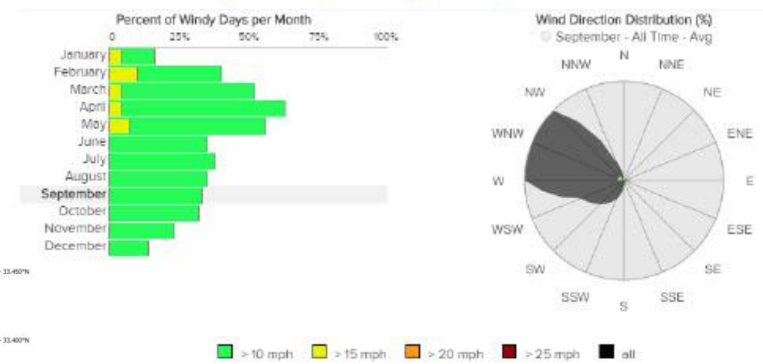






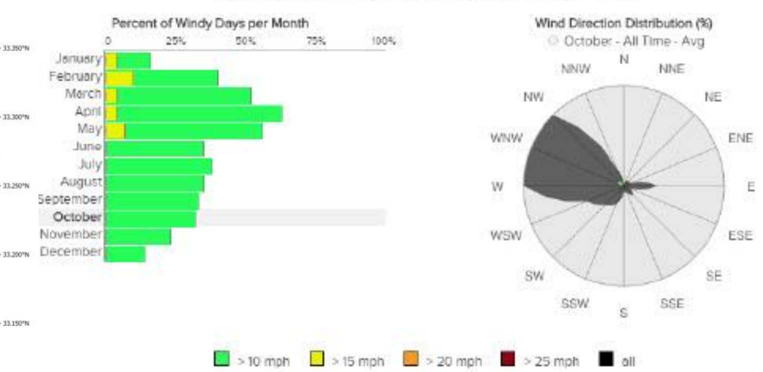


Exhibit P. Geology evidence

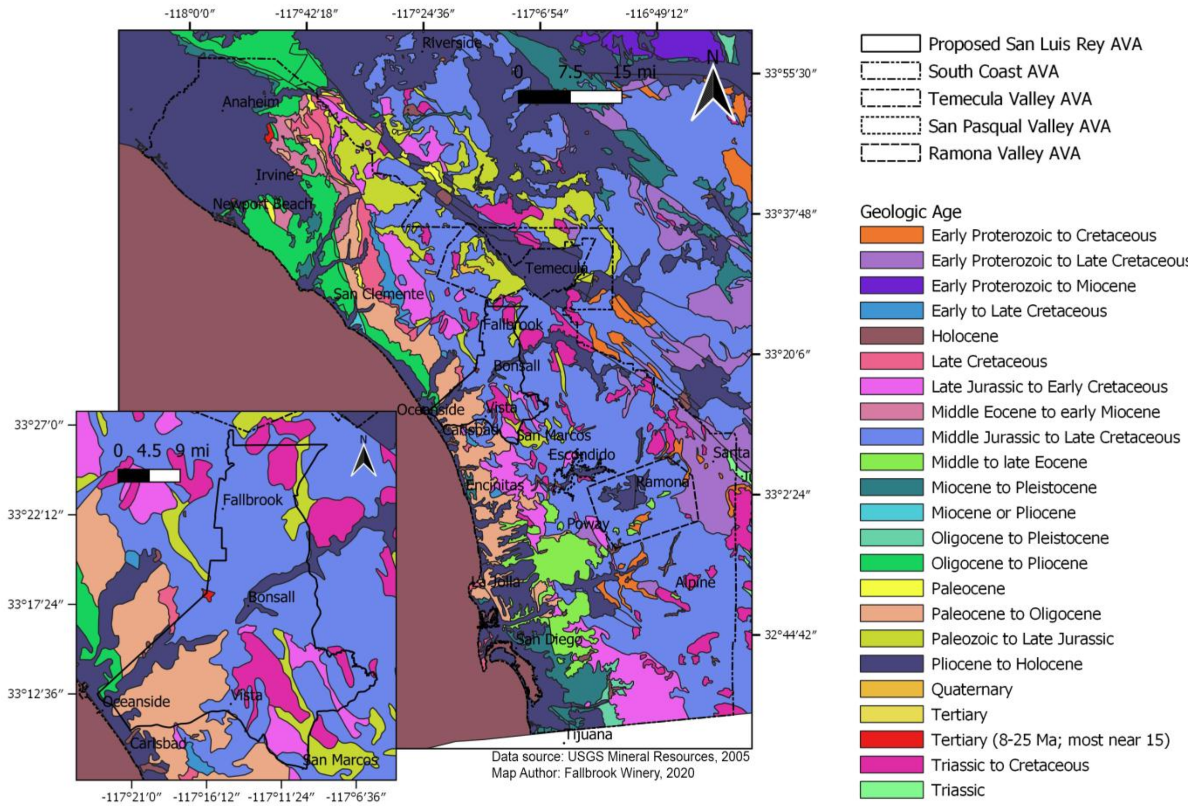


Figure 18. Geologic age map of South Coast AVA area.

Table 11. Percentage of predominant and second predominant lithology, forms or unconsolidated deposits found within the AVA areas (pl1 – predominant lighology, pl2 – second predominant lithology).

	Proposed San Luis Rey		**Temecula Valley**		**Ramona Valley**		**San Pasqual**		**South Coast**	
Lithology	**% pl1**	**% pl2**	**% pl1**	**% pl2**	**% pl1**	**% pl2**	**% pl1**	**% pl2**	**% pl1**	**% pl2**
tonalite	55.12	\	30.03	\	70.49	\	54.29	\	31.86	\
mudstone	14.99	0.60	\	\		\		\	7.43	10.60
gabbro	11.16	\	1.79	\	0.27	\	2.58	\	4.53	\
alluvium	7.73	\	41.84	\	13.57	\	39.60	\	22.62	\
felsic volcanic rock	5.74	\	0.28	\	0.09	\	0.13	\	7.07	\
argillite	4.45	\	22.88	\	\	\	\	\	4.20	\
sandstone	0.60	14.99	\	\	\	3.07	\	\	12.61	11.23
basalt	0.16	\	3.18	\	\		\	\	0.23	
quartz diorite	\	55.12	\	30.03	\	70.49	\	54.29	\	31.86
diorite	\	11.16	\	1.79	\	0.27	\	2.58	\	4.53
terrace	\	7.73	\	41.84	\	13.57	\	39.60	\	22.62
intermediate volcanic rock	\	5.74	\	0.28	\	0.09	\	0.13	\	7.07
graywacke	\	4.45	\	22.88	\	\	\	\	\	4.20
andesite	\	0.16	\	\	\	\	\	\	\	0.08
plutonic rock (phaneritic)	\	\	\	\	8.67	\	\	\	3.76	\
conglomerate	\	\	\	\	3.07	\	\	\	3.80	2.01
schist	\	\	\	\	2.99	\	\	\	0.96	\
gneiss	\	\	\	\	\	11.66	\	\	\	4.71
pelitic schist	\	\	\	\	\	\	\	\	0.08	\
mica schist	\	\	\	\	\	\	\	\	\	0.08
water	0.04	0.04	\	\	0.85	0.85	3.40	3.40	0.87	0.87
unknown	\	\	\	3.18	\	\	\	\	\	0.15

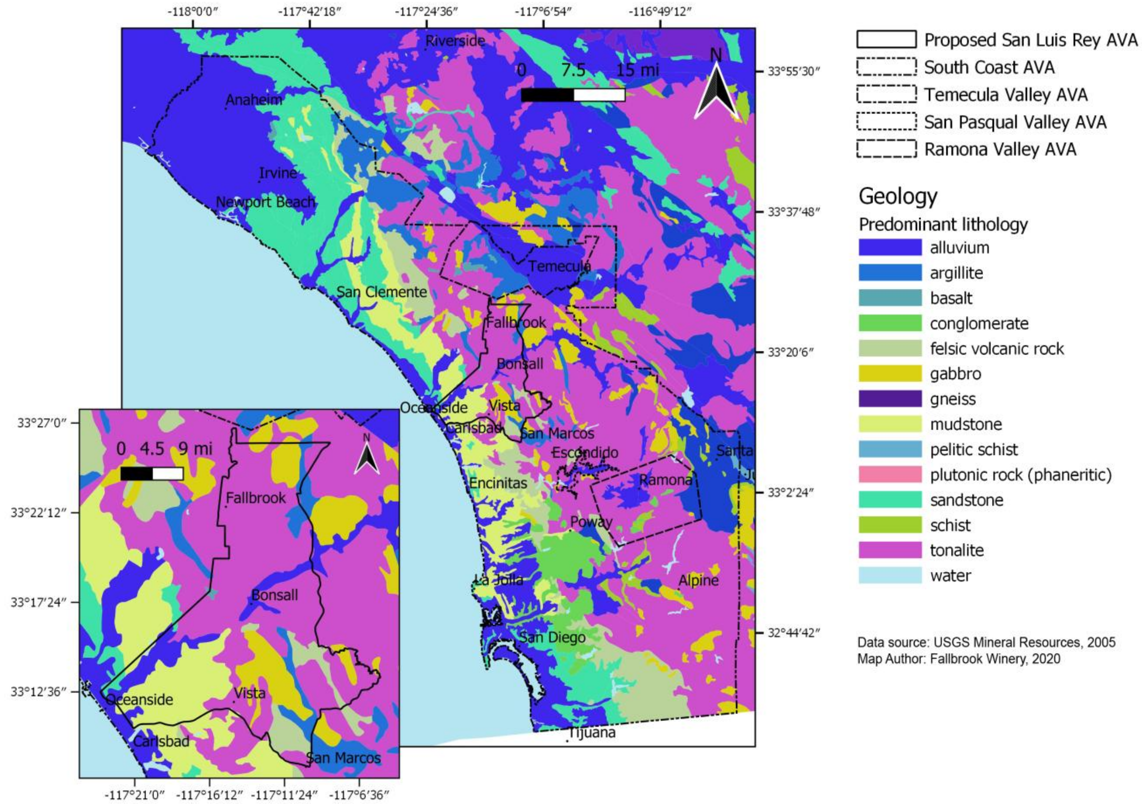


Figure 19. Map of predominantlithology

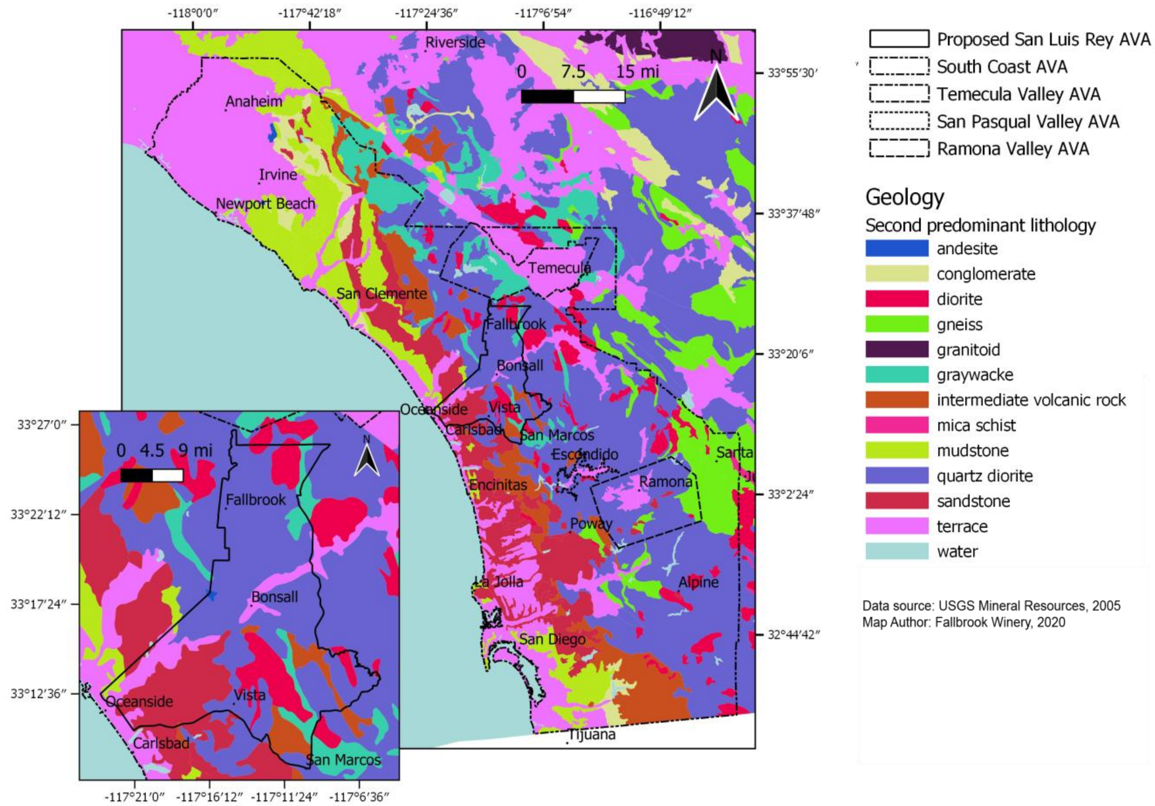


Figure 20. Map of second predominant lithology

Geology data (USGS - USGS Mineral Resources, 2005) was extracted, processed and analyzed as described in Appendix 1, section Geology.

Exhibit Q. Soil evidence

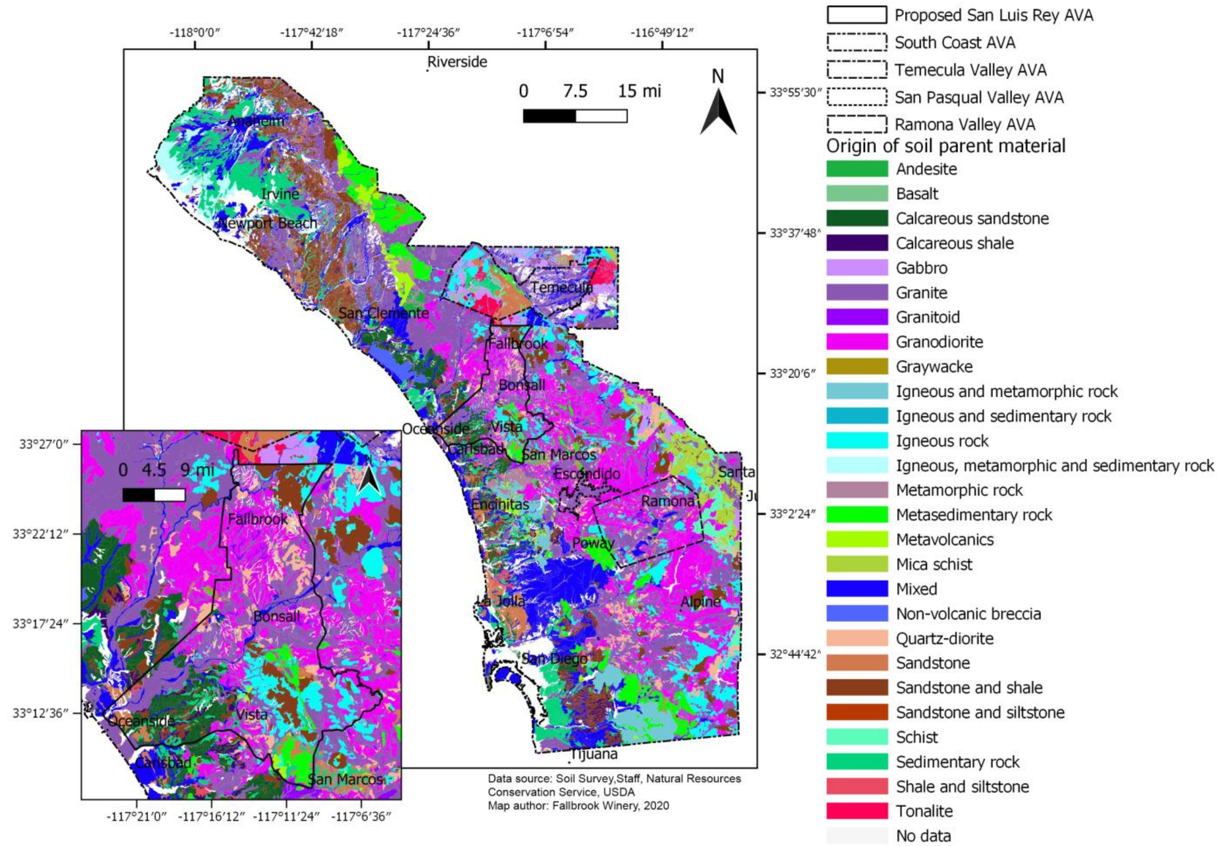


Figure 21. Map of soil parent material origin across South Coast AVA. Data source: Soil Survey Staff, Natural Resources Conservation Service, USDA, 2017; Soil Survey Staff, Natural Resources Conservation Service, USDA, 2018; Soil Survey Staff, Natural Resources Conservation Service, USDA, 2017a.

Table 12. Soil parent material share within Southern California AVAs.

Parent Material	South Coast		San Luis Rey		Temecula Valley		Ramona Valley		San Pasqual Valley	
	Area (acre)	% Total area	Area (acre)	% Total area	Area (acre)	% Total area	Area (acre)	% Total area	Area (acre)	% Total area
Granite	487479	22.69	28191	28.85	23075	25.77	32633	36.60	7221	77.48
Granodiorite	271999	12.66	19095	19.54	752	0.84	31419	35.23	1253	13.45
Mixed	247464	11.52	2912	2.98	9396	10.49	4476	5.02	255	2.74
Sandstone and shale	192947	8.98	8853	9.06	49	0.05	836	0.94	/	/
Sedimentary rock	144996	6.75	3140	3.21	4200	4.69	/	/	/	/
Igneous rock	108403	5.05	8261	8.45	9571	10.69	7592	8.51	/	/
Metasedimentary rock	82722	3.85	3175	3.25	2431	2.71	1619	1.82	37	0.40
Sandstone	55305	2.57	2512	2.57	11478	12.82	282	0.32	15	0.16
Calcareous sandstone	53219	2.48	7482	7.66	/	/	/	/	/	/
Quartz-diorite	53114	2.47	6260	6.41	1	<0.01	5228	5.86	226	2.42
Igneous and metamorphic rock	44811	2.09	/	/	/	/	/	/	40	0.43
Mica schist	40193	1.87	0	<0.01	183	0.20	813	0.91	/	/
Igneous, metamorphic and sedimentary rock	35717	1.66	/	/	549	0.61	/	/	/	/
Gabbro	32585	1.52	9	0.01	8695	9.71	/	/	/	/
Schist	26016	1.21	/	/	/	/	1541	1.73	/	/
Metavolcanics	21907	1.02	628	0.64	/	/	/	/	/	/
Metamorphic rock	21242	0.99	165	0.17	843	0.94	34	0.04	/	/
Calcareous shale	19063	0.89	1220	1.25	/	/	/	/	/	/
Tonalite	16484	0.77	81	0.08	8766	9.79	/	/	/	/
Non-volcanic breccia	9793	0.46	/	/	/	/	/	/	/	/
Granitoid	9556	0.44	1910	1.95	/	/	1982	2.22	5	0.06
Shale and siltstone	6270	0.29	260	0.27	/	/	/	/	/	/
Andesite	4214	0.20	/	/	/	/	/	/	/	/
Igneous and sedimentary rock	2581	0.12	/	/	/	/	/	/	/	/
Basalt	2186	0.10	/	/	2157	2.41	/	/	/	/
Graywacke	1444	0.07	/	/	/	/	/	/	/	/
Sandstone and siltstone	304	0.01	/	/	/	/	/	/	/	/
No data	156401	7.28	3579	3.66	7414	8.28	717	0.80	267	2.86

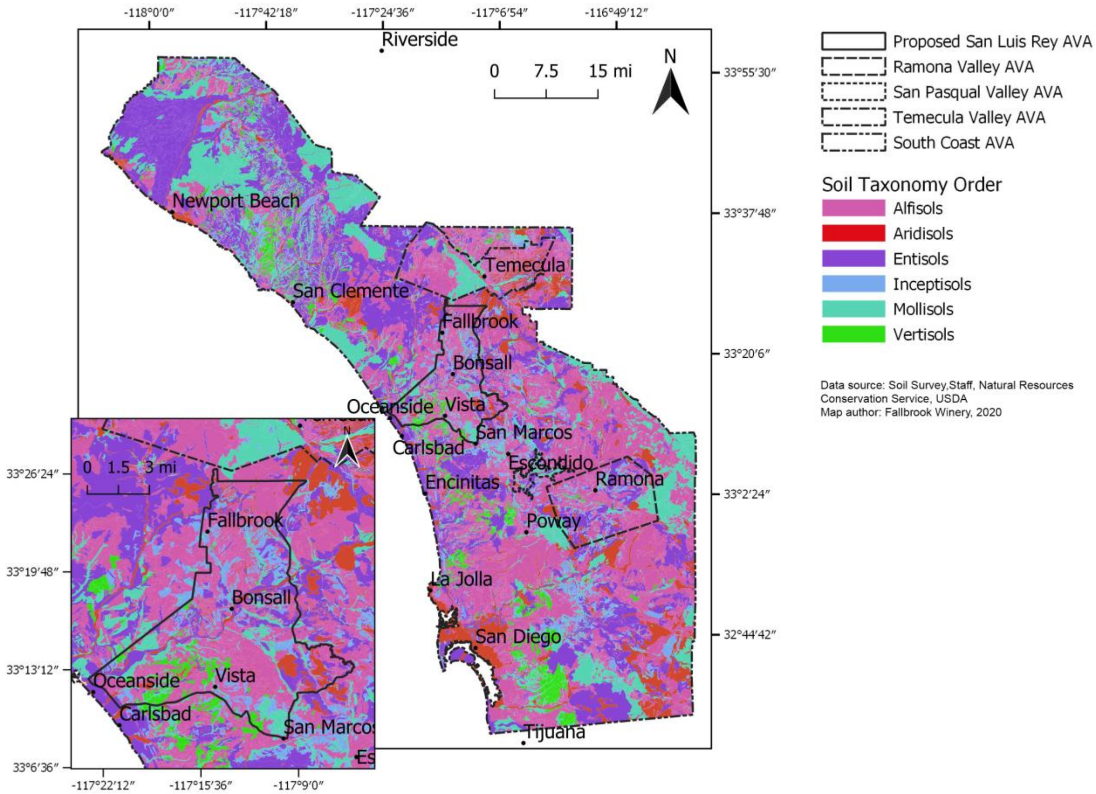


Figure 22. Soil Taxonomy order within South Coast AVAs. Data source: Soil Survey Staff, Natural Resources Conservation Service, USDA, 2017; Soil Survey Staff, Natural Resources Conservation Service, USDA, 2018; Soil Survey Staff, Natural Resources Conservation Service, USDA, 2017a.

Table 13. Soil taxonomy order within South Coast AVAs

	Percentage of AVA				
Soil Taxonomy Order	**South Coast**	**Proposed San Luis Rey**	**Temecula Valley**	**Ramona Valley**	**San Pasqual Valley**
Alfisols	37	49	48	46	33
Entisols	29	15	19	26	24
Mollisols	16	11	17	13	34
Inceptisols	5	12	2	9	4
Vertisols	4	5	<1	1	/
Aridisols	<0.1	/	<1	/	/
Unknown	9	7	12	6	6

Soil parent material and soil taxonomy data was retrieved, processed and analyzed as described in Appendix 1, section Soil Parent Material and Soil Taxonomy Order.

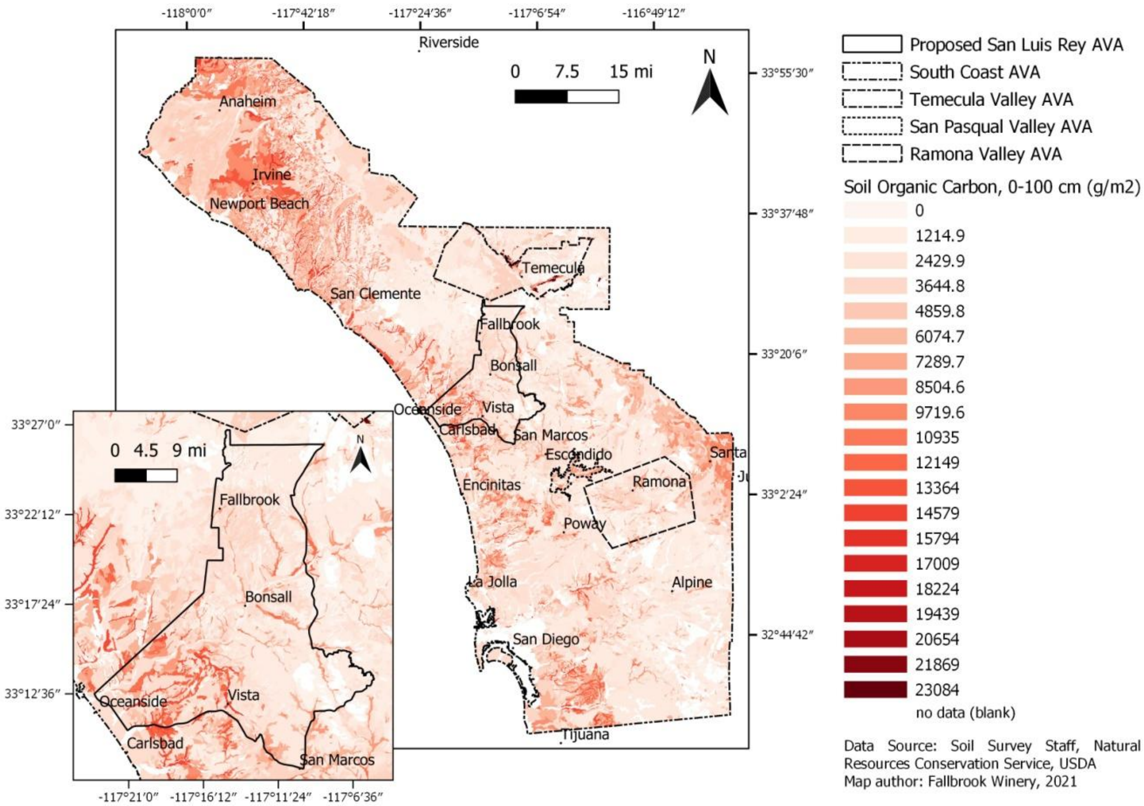


Figure 23. Soil Organic Carbon within South Coast AVAs

Table 14. Average soil organic carbon content, depth 0-100 cm

	Soil Organic Carbon (g/m^2)			
	Mean	**Std. dev.**	**Max**	**Min**
South Coast AVA	3525	3150	23084	0
Proposed San Luis Rey AVA	3336	2934	14433	50

Organic carbon data was retrieved, processed and analyzed as described in Appendix 1, section Soil Organic Carbon.

Table 15. Soil series (consociations,complexes or associations) and miscellanious areaspresent in the proposed San Luis Rey and South Coast AVAs.

	San Luis Rey AVA		South Coast AVA	
Soil Series	**Acres**	**% of total area**	**Acres**	**% of total area**
Las Posas	12164.9	12.4	76168.5	3.5
Fallbrook	11787.3	12.1	115747.3	5.4
Cieneba	10151.4	10.4	244450.2	11.4
Vista	7405.0	7.6	61410.0	2.9
Las Flores	7243.7	7.4	30509.4	1.4
Placentia	5405.0	5.5	28969.6	1.3
Visalia	3731.1	3.8	41060.3	1.9
Diablo	3642.1	3.7	32477.3	1.5
Tujunga	3231.8	3.3	20116.0	0.9
Friant	3175.2	3.2	76864.0	3.6
Fallbrook-Vista	3134.1	3.2	14481.7	0.7
Acid igneous rock land	2751.4	2.8	62561.4	2.9
Steep gullied land	2722.0	2.8	6424.8	0.3
Cieneba-Fallbrook	2574.7	2.6	122261.2	5.7
Ramona	2164.9	2.2	33798.1	1.6
Bonsall	1758.6	1.8	6380.8	0.3
Wyman	1702.3	1.7	4953.6	0.2
Salinas	1626.6	1.7	13896.5	0.6
Escondido	1533.8	1.6	14658.2	0.7
Huerhuero	1460.6	1.5	31784.5	1.5
Riverwash	1392.2	1.4	26586.9	1.2
Grangeville	1073.1	1.1	7076.0	0.3
Bosanko	657.8	0.7	13034.6	0.6
Greenfield	656.1	0.7	12521.8	0.6
Auld	627.7	0.6	2809.9	0.1
Chesterton	612.7	0.6	7411.6	0.3
Altamont	426.8	0.4	11944.3	0.6
Terrace escarpments	401.3	0.4	21404.2	1.0
Carlsbad	390.7	0.4	5491.4	0.3
Linne	331.6	0.3	8685.3	0.4
Salt pond	247.1	0.3	247.1	0.0
Chino	180.3	0.2	19088.4	0.9
Marina	171.3	0.2	18710.8	0.9
Olivenhain	169.5	0.2	33669.8	1.6
Loamy alluvial land-Huerhuero	159.2	0.2	6506.3	0.3
Gaviota	143.5	0.1	16201.1	0.8
Carlsbad-Urban	127.4	0.1	1943.1	0.1
Diablo-Urban	121.1	0.1	6284.3	0.3
Corralitos	94.6	0.1	9912.2	0.5
Made land	89.9	0.1	5941.2	0.3
Water	89.3	0.1	14925.1	0.7
Redding	49.5	0.1	51908.8	2.4
Arlington	43.2	<0.1	7638.3	0.4
Clayey alluvial land	38.4	<0.1	969.9	<0.1
Tidal flats	21.0	<0.1	6193.1	0.3
Rough broken land	16.8	<0.1	17412.7	0.8
Exchequer	12.8	<0.1	7626.9	0.4
Gravel	8.9	<0.1	1856.9	0.1
Bull Trail	8.9	<0.1	405.1	<0.1
Hanford	3.0	<0.1	9989.5	0.5
Rockland	0.1	<0.1	4784.7	0.2
Myford	/	/	49217.1	2.3
San Miguel	/	/	48727.1	2.3
Calleguas	/	/	37072.8	1.7
Holland	/	/	36915.4	1.7
Cieneba-Rock	/	/	32320.5	1.5
Metz	/	/	31399.7	1.5
Alo	/	/	29464.4	1.4
Sheephead	/	/	24855.8	1.2

Hueneme	/	/	23198.2	1.1
San Emigdios	/	/	22413.6	1.0
Urban land	/	/	22212.0	1.0
Sorrento	/	/	21456.7	1.0
Bolsa	/	/	19882.2	0.9
Huerhuero-Urban	/	/	17716.4	0.8
Mocho	/	/	17467.4	0.8
Anaheim	/	/	15778.8	0.7
Exchequer-Rock	/	/	15572.9	0.7
Cajalco	/	/	13991.2	0.7
Rock	/	/	13385.6	0.6
Lodo	/	/	13049.7	0.6
Crouch	/	/	12071.4	0.6
Blasingame	/	/	11944.0	0.6
Bancas	/	/	10388.4	0.5
Tollhouse	/	/	10309.1	0.5
Redding-Urban	/	/	10217.0	0.5
Soboba	/	/	10098.8	0.5
Hambright	/	/	9792.9	0.5
Soper	/	/	9391.8	0.4
Boomer	/	/	8351.1	0.4
Capistrano	/	/	8091.9	0.4
Omni	/	/	7547.7	0.4
Chesterton-Urban	/	/	6500.1	0.3
Balcom	/	/	6333.5	0.3
Yorba	/	/	6262.8	0.3
Beaches	/	/	5830.7	0.3
Gullied	/	/	5726.3	0.3
Metamorphic rock land	/	/	5579.2	0.3
Modjeska	/	/	5464.5	0.3
Botella	/	/	5427.9	0.3
La Posta	/	/	5360.2	0.2
Olivenhain-Urban	/	/	5280.6	0.2
Stony land	/	/	5222.5	0.2
Diablo-Olivenhain	/	/	5196.4	0.2
Cropley	/	/	4860.9	0.2
Stockpen	/	/	4290.1	0.2
Gabino	/	/	4241.8	0.2
Vallecitos	/	/	4186.4	0.2
Monserate	/	/	3359.2	0.2
Xerorthents	/	/	3273.0	0.2
Reiff	/	/	2824.2	0.1
Bosanko-Balcom	/	/	2723.9	0.1
Anderson	/	/	2596.4	0.1
Loamy alluvial land	/	/	2398.8	0.1
Bonsall-Fallbrook	/	/	2396.8	0.1
Xeralfic	/	/	2307.0	0.1
Murrieta	/	/	2185.9	0.1
Pits	/	/	1921.5	0.1
Arbuckle	/	/	1681.1	0.1
Badland	/	/	1598.5	0.1
Cieneba-Blasingame-Rock	/	/	1584.1	0.1
Laughlin	/	/	1443.5	0.1
Lagoon	/	/	1403.0	0.1
Soper-Rock	/	/	1371.7	0.1
Elder	/	/	1360.1	0.1
Nacimiento	/	/	1258.5	0.1
San Andreas	/	/	1203.7	0.1
Rincon	/	/	1169.9	0.1
San Timoteo	/	/	1146.8	0.1
Calpine	/	/	894.1	<0.1
Gorgonio	/	/	880.2	<0.1
Porterville	/	/	724.1	<0.1
Garretson	/	/	661.0	<0.1
Mottsville	/	/	598.0	<0.1
Ysidora	/	/	592.5	<0.1

Gaviota-Chumash-Rock	/	/	589.4	<0.1
Honcut	/	/	517.7	<0.1
Blasingame-Rock	/	/	514.6	<0.1
Pachappa	/	/	391.2	<0.1
Tollhouse-Rock	/	/	309.2	<0.1
Thapto-Histic Fluvaquents	/	/	303.5	<0.1
Wet	/	/	302.7	<0.1
Blasingame-Vista	/	/	238.3	<0.1
Buchenau	/	/	190.2	<0.1
Yokohl	/	/	178.4	<0.1
Apollo,	/	/	168.8	<0.1
Willows	/	/	155.2	<0.1
Domino	/	/	140.5	<0.1
Zaca-Apollo	/	/	135.7	<0.1
Bolsa,	/	/	132.7	<0.1
Buren	/	/	104.6	<0.1
Dam	/	/	101.4	<0.1
Counterfeit-Urban	/	/	68.9	<0.1
Quarries	/	/	47.7	<0.1
Cortina	/	/	21.3	<0.1
Perkins	/	/	13.5	<0.1
Madera	/	/	5.8	<0.1
Exeter	/	/	3.3	<0.1
Traver	/	/	1.9	<0.1

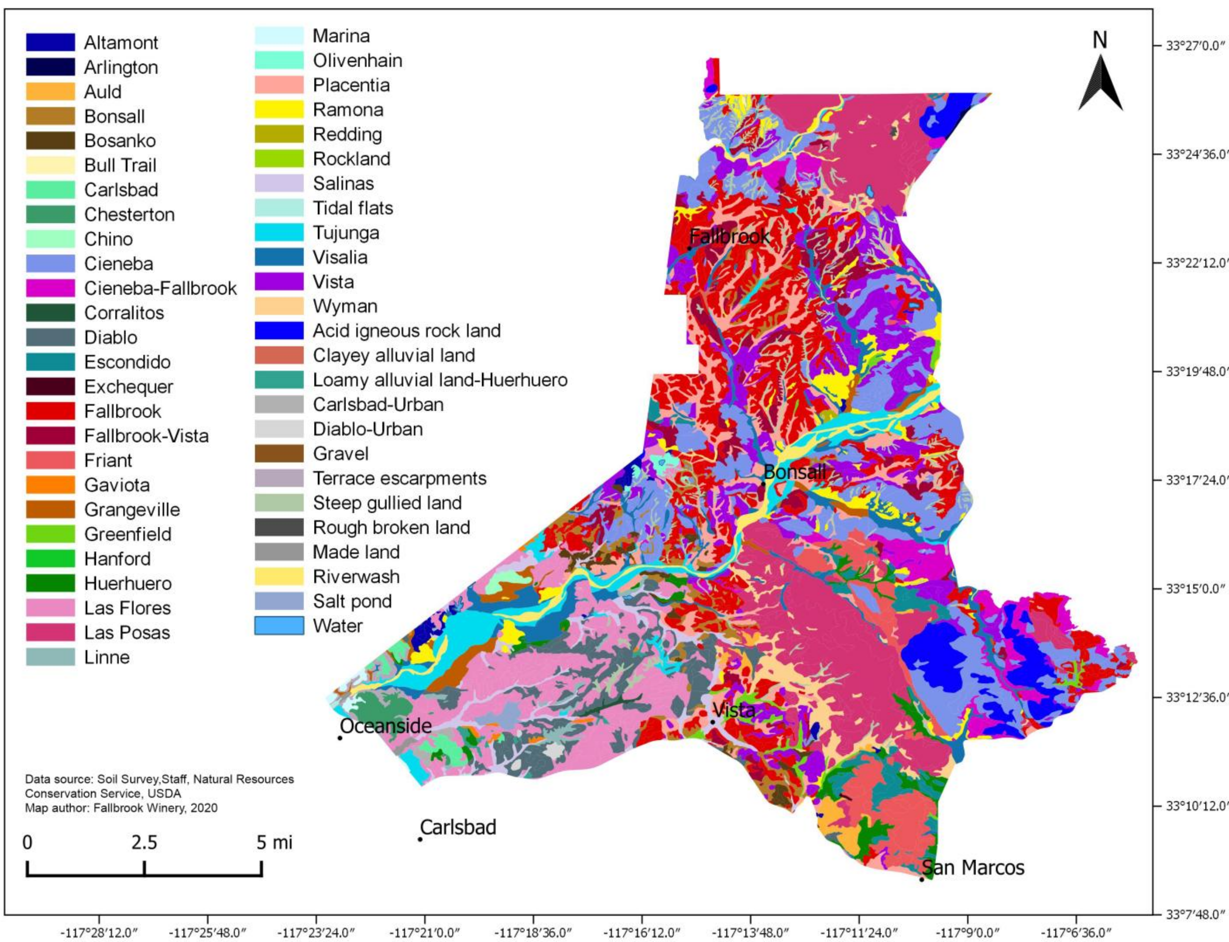


Figure 24. Soil series and miscellanious areas in the proposed San Luis Rey AVA

Soil series data was extracted, processed and analyzed as described in Appendix 1, section Soil Series.

Table 16. Soil texture in South Coast AVA and proposed San Luis Rey AVA

	South Coast AVA		Proposed San Luis Rey AVA	
Texture	**Acre**	**% area**	**Acre**	**% area**
sandy loam	325422.37	15.15	27912.02	28.56
coarse sandy loam	80843.00	3.76	11171.43	11.43
stony fine sandy loam	83520.86	3.89	8302.03	8.49
loamy fine sand	28167.68	1.31	6480.40	6.63
fine sandy loam	152506.98	7.10	6253.40	6.40
clay	103075.73	4.80	5637.38	5.77
very rocky coarse sandy loam	124806.29	5.81	4536.86	4.64
sand	19558.23	0.91	3231.81	3.31
loam	89845.12	4.18	3164.10	3.24
rocky sandy loam	167444.60	7.79	3149.93	3.22
acid igneous rock land	62561.39	2.91	2751.41	2.82
gullied land	6424.79	0.30	2722.00	2.79
rocky fine sandy loam	75684.83	3.52	2605.34	2.67
rocky coarse sandy loam	70259.34	3.27	1894.41	1.94
clay loam	89779.98	4.18	1611.48	1.65
very fine sandy loam	12753.17	0.59	1533.66	1.57
riverwash	26586.92	1.24	1392.17	1.42
urban land	72882.00	3.39	1011.86	1.04
terrace escarpments	21404.22	1.00	401.32	0.41
gravelly loamy sand	7345.38	0.34	390.65	0.40
salt pond	247.13	0.01	247.13	0.25
cobbly loam	68305.06	3.18	219.01	0.22
silt loam	22112.70	1.03	180.02	0.18
loamy coarse sand	14461.80	0.67	171.33	0.18
loamy alluvial land	8905.10	0.41	159.16	0.16
gravelly sandy loam	6790.91	0.32	158.79	0.16
loamy sand	48106.25	2.24	94.59	0.10
made land	5941.18	0.28	89.88	0.09
water	14925.14	0.69	89.25	0.09
stony clay	1432.34	0.07	63.86	0.07
clayey alluvial land	969.94	0.05	38.38	0.04
tidal flats	6193.08	0.29	21.01	0.02
rough broken land	17412.67	0.81	16.83	0.02
rocky silt loam	56354.04	2.62	12.77	0.01
gravel pits	1856.88	0.09	8.90	0.01
rocky loam	21450.48	1.00	7.91	0.01
rockland	4784.72	0.22	0.08	<0.01
rock outcrop	66876.89	3.11	/	/
gravelly loam	34748.66	1.62	/	/
stony loam	28162.86	1.31	/	/
gravelly clay loam	18324.76	0.85	/	/
silty clay loam	17414.36	0.81	/	/
complex - not defined	8595.65	0.41	/	/
gullied land	5726.26	0.27	/	/
metamorphic rock land	5579.15	0.26	/	/
rocky loamy coarse sand	5245.71	0.24	/	/
stony land	5222.51	0.24	/	/
stony loamy sand	4467.39	0.21	/	/
beaches	4103.06	0.19	/	/
cobbly sandy loam	3835.69	0.18	/	/
cobbly loamy sand	3777.42	0.18	/	/
very gravelly sandy loam	2596.38	0.12	/	/
stony clay loam	2185.85	0.10	/	/
pits	1921.48	0.09	/	/
coastal beaches	1727.63	0.08	/	/
badland	1598.53	0.07	/	/
lagoon water	1403.05	0.07	/	/
shaly fine sandy loam	1360.08	0.06	/	/
gravelly very fine sandy loam	934.04	0.04	/	/
Thapto-Histic Fluvaquents	303.52	0.01	/	/
Wet alluvial land	302.66	0.01	/	/
cobbly clay	279.66	0.01	/	/
cobbly coarse sandy loam	271.96	0.01	/	/
silty clay	155.23	0.01	/	/
Dam	101.40	0.00	/	/
Quarries	47.67	0.00	/	/
gravelly fine sandy loam	10.35	0.00	/	/
gravelly loamy fine sand	9.03	0.00	/	/
stony sandy loam	3.12	0.00	/	/

Soil texture data was extracted, processed and analyzed as described in Appendix 1, section Soil Texture.

Exhibit R. Elevation and slope

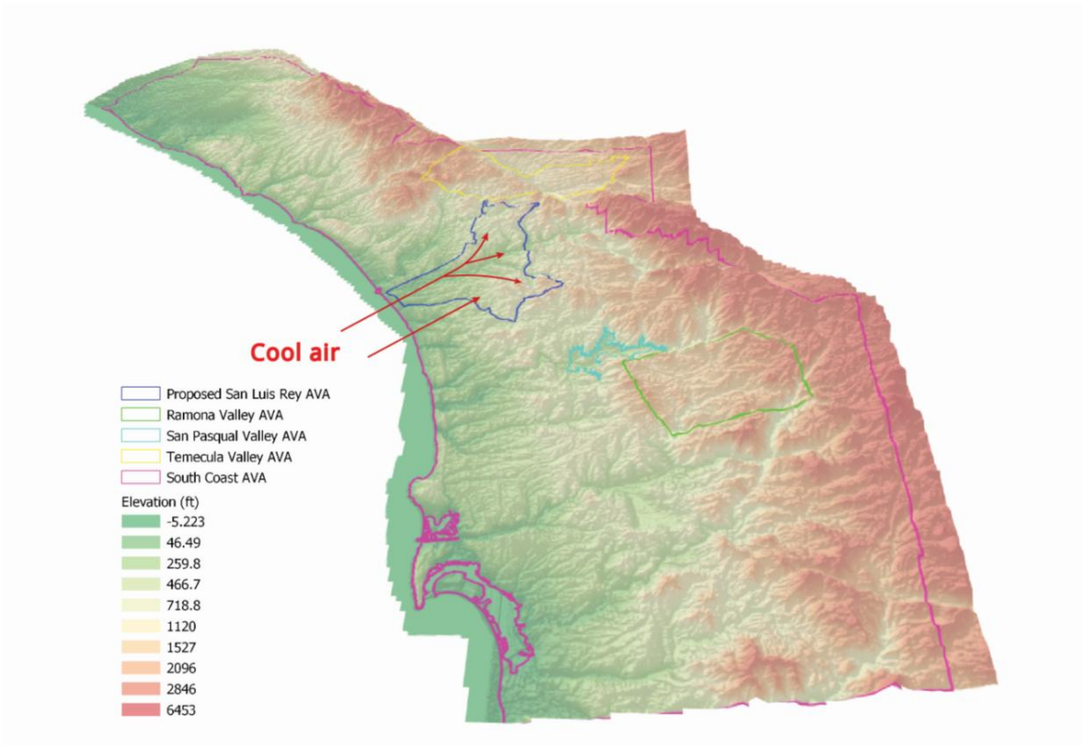


Figure 25. Three-dimensional presentation of the terrain in South Coast AVA area showing the passage of cooling air from the Pacific Ocean entering San Luis Rey valley. Data source: U.S. Geological Survey. Author: Fallbrook Winery, 2020

Table 17. Raster statistic for elevation within AVAs.

AREA	Max (feet)	Mean (feet)	Min (feet)	Std. Dev. (feet)
South Coast AVA	5597	1132	5	697
Proposed SLR	1796	563	5	351
Temecula Valley AVA	2831	1508	575	408
San Pasqual Valley AVA	725	408	304	59
Ramona Valley AVA	3133	1766	680	456

Elevation data was retrieved, processed and analyzed as described in Appendix 1, section Elevation.

Table 18. Raster statistic for slope within AVAs.

			Slope (degree)		
	Mean	Median	Std. dev.	Min	Max
Proposed San Luis Rey AVA	10	8	8	0	65
South Coast AVA	12	9	11	0	78
Ramona Valley AVA	12	9	9	0	76
San Pasqual Valley AVA	6	3	7	0	48
Temecula Valley AVA	10	8	9	0	64

Elevation data was retrieved, processed and analyzed as described in Appendix 1, section Slope.

Exhibit S. Other winery and vineyard owners or operators supporting this petition

- Jade Work, Monserate Winery
- Izaac Villalobos, Moody Creek Farms and Moody Creek Winery
- George R. Murray and Kimberly A. Murray, Beach House Winery
- Vickie Landig-Merrick and Gordon Merrick, Adobe Hill Vineyard
- Matthew Sherman, Myrtle Creek Vineyards and Winery

12. Appendices

Appendix 1. Data and Methods

South Coast American Viticultural Area (AVA)

The boundary of South Coast AVA was digitized following description in CFR (27 Electronic Code of Federal Regulations §9.104, 2019).

Temecula Valley American Viticultural Area (AVA)

The boundary of South Coast AVA was digitized following description in CFR (27 Electronic Code of Federal Regulations §9.50, 2019)

San Pasqual Valley American Viticultural Area (AVA)

The boundary of South Coast AVA was digitized following description in CFR (27 Electronic Code of Federal Regulations §9.25, 2019)

Ramona Valley American Viticultural Area (AVA)

The boundary of South Coast AVA was digitized following description in CFR (27 Electronic Code of Federal Regulations §9.191, 2019)

Average Annual Precipitation

Average annual precipitation data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012c). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average annual precipitation at 800 m grid cell resolution. Original dataset value units were millimeters and were converted to inches. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline shape. For each of these areas a basic statistic of the cell values within the area was calculated.

Average Annual Mean Temperature

Average annual mean temperature data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012b). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average annual maximum temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Average Annual Maximum Temperature

Average annual maximum temperature data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012a). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average annual mean temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit.Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Average July Maximum Temperature

Average July maximum temperature data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012e). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average July maximum temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Average August Maximum Temperature

Average August maximum temperature data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012d). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average August maximum temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Average September Maximum Temperature

Average September maximum temperature data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012f). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average September maximum temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Average October Maximum Temperature

Average October maximum temperature data was retrieved from PRISM Climate Group at Oregon State University data portal (PRISM Climate Group at Oregon State University, 2012g). Monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average October maximum temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Daily Temperature Variation, Monthly Average

Monthly average for daily temperature variation was calculated by subtracting average monthly minimum temperature from the average monthly maximum temperature. Data was retrieved from PRISM Climate Group at Oregon State University data portal ((PRISM Climate Group at Oregon State University, 2012e)(PRISM Climate Group at Oregon State University, 2012h)(PRISM Climate Group at Oregon State University, 2012d)(PRISM Climate Group at Oregon State University, 2012i)(PRISM Climate Group at Oregon State University, 2012f)(PRISM Climate Group at Oregon State University, 2012j)(PRISM Climate Group at Oregon State University, 2012g)(PRISM Climate Group at Oregon State University, 2012k)). Original monthly 30-year normal dataset covers the conterminous U.S., averaged over the climatological period 1981 – 2010. It contains spatially gridded average monthly maximum or minimum temperature at 800 m grid cell resolution. Original dataset value units were degrees Celsius and were converted to degrees Fahrenheit. Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file.

Growing Degree Days

Temperature Accumulations (30- year average / 50 base temperature) data was retrieved from the USA National Phenology Network (USA National Phenology Network, 2017a), (USA National Phenology Network, 2017b) in Tiff format. Values from the dataset for long-term temperature accumulation averages between January 1st and March 30st (90 days) were subtracted from the dataset valuesfor long-term temperature accumulation averages between January 1st and October 31st (304 days) to obtain temperature accumulation averages for the period between April 1st and October 31st.Raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Geology

Geology data was retrieved from Preliminary integrated geologic map database for the United States on US Geological Survey Open-File report website(USGS - USGS Mineral Resources, 2005).Data came in ESRI shape format and was clipped to extract areas of existing Southern California AVAs using South Coast

AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas the percentage of predominant and second predominant lithology was calculated.

Soil

Soil Survey geospatial data was retrieved from USDA Geospatial Data Gateway portal(Soil Survey Staff, Natural Resources Conservation Service, USDA, 2017)(Soil Survey Staff, Natural Resources Conservation Service, USDA, 2018)(Soil Survey Staff, Natural Resources Conservation Service, USDA, 2017a). Soil survey map units were joined with the values from Valu1 table retrieved from USDA Geospatial Data Gateway portal (Soil Survey Staff, Natural Resources Conservation Service, USDA, 2018)or values queried in Soil Data Mart (Soil Survey Staff, Natural Resources Conservation Service, USDA, 2019)using mukey field as the primary key.

Soil Parent Material and Soil Taxonomy Order

Soil dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas the percentage of area covered by each soil parent material and soil taxonomy order was calculated. The percentage of soil series was calculated for South Coast AVA and the proposed San Luis Rey AVA areas.

Soil Organic Carbon

The original Soil Survey dataset was in ESRI shape file format. Since soil survey map units are not all of the same size an averaged data value over an area would not be realistic representation. Dataset was therefore converted to raster to obtain grid of same size cells with soil organic carbon values. This converted dataset was then clipped with ESRI shape files of South Coast AVA, in this document proposed San Luis Rey AVA,Temecula Valley AVA, Ramona Valley AVA and San Pasqual Valley AVA. Basic statistic was calculated for these AVAs.

Soil Series

The maps and tables with soil information in this document are based on Soil survey map unit information. Soil survey map unit is a basic unit that in some respect differs from other units. Each map unit has a unique symbol and a name (which is a soil type description, for example *Fallbrook sandy loam, 9 to 15 percent slopes, eroded)* that is dominated by a single or similar component. Soil data analysis in this document are based on the dominant component of the map unit (a map unit can have one or more component). Since ananalysis and comparison of map unit names over large areas such as South Coast AVA and the proposed San Luis Rey AVA is impractical, the data was grouped for the purpose of this document. For example, *Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded*and *Fallbrook fine sandy loam, shallow, 8 to 15 percent slopes, eroded*and *Fallbrook rocky sandy loam, 5 to 9 percent slopes and*Fallbrook rocky sandy loam, 9 to 30 percent slopes and Fallbrook rocky sandy loam, 9 to 30 percent slopes, eroded and *Fallbrook rocky sandy loam, shallow, 15 to 50 percent slopes, eroded* and *Fallbrook rocky sandy loam, shallow, 8 to 15 percent slopes, eroded* and *Fallbrook sandy loam, 15 to 25 percent slopes, eroded* and *Fallbrook sandy loam, 15 to 30 percent slopes, eroded* and *Fallbrook sandy loam, 2 to 5 percent slopes* and *Fallbrook sandy loam, 5 to 9 percent slopes* and *Fallbrook sandy loam, 5 to 9 percent slopes, eroded* and *Fallbrook sandy loam, 8 to 15 percent slopes, eroded* and *Fallbrook sandy* *loam, 9 to 15 percent slopes, eroded* and *Fallbrook sandy loam, 9 to 30 percent slopes, severely eroded* and *Fallbrook sandy loam, shallow, 15 to 35 percent slopes, eroded* and *Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded* soil types have been grouped as Fallbrook soil series.This operation was performed using the following script in QGIS field calculator:

```
CASE
WHEN "muname" like ('%' || 'Acid igneous rock land' || '%') then "muname"
WHEN "muname" like ('Balcom' || '%') then 'Balcom'
WHEN "muname" like ('Beaches') then "muname"
WHEN "muname" like ('Blasingame-Rock') then 'Blasingame'
WHEN "muname" like ('%' || 'Bull Trail' || '%') then 'Bull Trail'
WHEN "muname" like ('Cieneba-Blasingame-Rock') then 'Cieneba-Blasingame'
WHEN "muname" like ('Cieneba-Rock') then 'Cieneba'
WHEN "muname" like ('%' || 'Clayey alluvial' || '%') then "muname"
WHEN "muname" like ('%' || 'Coastal beaches' || '%') then 'Beaches'
WHEN "muname" like ('Exchequer-Rock') then 'Exchequer'
WHEN "muname" like ('%' || 'Beaches' || '%') then 'Beaches'
WHEN "muname" like ('Gaviota-Chumash-Rock') then 'Gaviota-Chumash'
WHEN "muname" like ('%' || 'Indio' || '%' || 'dark variant' || '%') then "muname"
WHEN "muname" like ('%' || 'Kitchen Creek' || '%') then 'Kitchen Creek'
WHEN "muname" like ('La Posta'|| '%') then 'La Posta'
WHEN "muname" like ('Las Flores'|| '%') then 'Las Flores'
WHEN "muname" like ('Las Flores-Urban'|| '%') then 'Las Flores-Urban'
WHEN "muname" like ('Las Posas'|| '%') then 'Las Posas'
WHEN "muname" like ('Loamy alluvial land') then "muname"
WHEN "muname" like ('Loamy alluvial land-Huerhuero') then 'Loamy alluvial land-Huerhuero'
WHEN "muname" like ('Loamy alluvial land-Huerhuero complex, 9 to 50 percent slopes, severely eroded') then 'Loamy alluvial land-Huerhuero'
WHEN "muname" like ('Made land') then "muname"
WHEN "muname" like ('Metamorphic rock land') then "muname"
WHEN "muname" like ('Rough broken land') then "muname"
WHEN "muname" like ('Riverwash') then "muname"
WHEN "muname" like ('Rock outcrop-Cieneba') then 'Rock outcrop-Cieneba'
WHEN "muname" like ('Salt pond') then "muname"
WHEN "muname" like ('San Andreas' || '%') then 'San Andreas'
WHEN "muname" like ('San Emigdio' || '%') then 'San Emigdios'
WHEN "muname" like ('San Miguel' || '%') then 'San Miguel'
WHEN "muname" like ('San Miguel-Exchequer' || '%') then 'San Miguel-Exchequer'
WHEN "muname" like ('San Timoteo' || '%') then 'San Timoteo'
WHEN "muname" like ('Sloping gullied land') then "muname"
WHEN "muname" like ('Soper-Rock') then 'Soper'
WHEN "muname" like ('Steep gullied land') then "muname"
WHEN "muname" like ('Stony land') then "muname"
WHEN "muname" like ('Terrace escarpments') then "muname"
WHEN "muname" like ('Thapto-Histic Fluvaquents') then "muname"
WHEN "muname" like ('Tidal flats') then "muname"
WHEN "muname" like ('Tollhouse-Rock') then "muname"
WHEN "muname" like ('Urban land' || '%') then 'Urban land'
WHEN "muname" like ('Vista-Rock' || '%') then 'Vista'
WHEN "muname" like ('Zaca-Apollo' || '%') then 'Zaca-Apollo'
WHEN "muname" is 'Water' or "muname" is 'Rockland' or "muname" is 'Pits' or "muname" is 'Badland' or "muname" is 'Quarries' then "muname"
WHEN "muname" is 'Dam' or "muname" is 'Dams' then 'Dam'
else left("muname",regexp_match( "muname", '(\\s)' ))
END
```

Soil dataset was clipped using South Coast AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file to extract South Coast AVA and proposed San Luis Rey AVA. The percentage of area for each soil series was calculated for both AVAs.

Soil Texture

Since an analysis and comparison of map unit names over large areas such as South Coast AVA and the proposed San Luis Rey AVA is impractical, the data was grouped for the purpose of this document. For example, *Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded*and *Fallbrook fine sandy loam, shallow, 8 to 15 percent slopes, eroded*have been grouped as sandy loam texture.This operation was performed using the following script in QGIS field calculator:

```
CASE
WHEN "muname" like ('%' || 'cobbly loamy sand' || '%') then 'cobbly loamy sand'
WHEN "muname" like ('%' || 'gravelly loamy sand' || '%') then 'gravelly loamy sand'
WHEN "muname" like ('%' || 'Xerorthents loamy' || '%') then 'loam'
WHEN "muname" like ('%' || 'cobbly coarse sandy loam' || '%') then 'cobbly coarse sandy loam'
WHEN "muname" like ('%' || 'very rocky coarse sandy loam' || '%') then 'very rocky coarse sandy loam'
WHEN "muname" like ('%' || 'rocky coarse sandy loam' || '%') then 'rocky coarse sandy loam'
WHEN "muname" like ('%' || 'coarse sandy loam' || '%') then 'coarse sandy loam'
WHEN "muname" like ('%' || 'very gravelly sandy loam' || '%') then 'very gravelly sandy loam'
WHEN "muname" like ('%' || 'gravelly sandy loam' || '%') then 'gravelly sandy loam'
WHEN "muname" like ('%' || 'gravelly very fine sandy loam' || '%') then 'gravelly very fine sandy loam'
WHEN "muname" like ('%' || 'gravelly fine sandy loam' || '%') then 'gravelly fine sandy loam'
WHEN "muname" like ('%' || 'very fine sandy loam' || '%') then 'very fine sandy loam'
WHEN "muname" like ('%' || 'stony fine sandy loam' || '%') then 'stony fine sandy loam'
WHEN "muname" like ('%' || 'stony sandy loam' || '%') then 'stony sandy loam'
WHEN "muname" like ('%' || 'rocky silt loams' || '%') then 'rocky silt loam'
WHEN "muname" like ('%' || 'rocky silt loam' || '%') then 'rocky silt loam'
WHEN "muname" like ('%' || 'Urban land complex' || '%') then 'urban land'
WHEN "muname" like ('%' || 'stony loamy sand' || '%') then 'stony loamy sand'
WHEN "muname" like ('%' || 'stony loam' || '%') then 'stony loam'
WHEN "muname" like ('%' || 'rocky loamy coarse sand' || '%') then 'rocky loamy coarse sand'
WHEN "muname" like ('%' || 'gravelly clay loam' || '%') then 'gravelly clay loam'
WHEN "muname" like ('%' || 'stony clay loam' || '%') then 'stony clay loam'
WHEN "muname" like ('%' || 'stony clay' || '%') then 'stony clay'
WHEN "muname" like ('%' || 'silty clay loam' || '%') then 'silty clay loam'
WHEN "muname" like ('%' || 'silty clay' || '%') then 'silty clay'
WHEN "muname" like ('%' || 'silt loam' || '%') then 'silt loam'
WHEN "muname" like ('%' || 'shaly fine sandy loam' || '%') then 'shaly fine sandy loam'
WHEN "muname" like ('%' || 'rocky fine sandy loam' || '%') then 'rocky fine sandy loam'
WHEN "muname" like ('%' || 'fine sandy loams' || '%') then 'fine sandy loam'
WHEN "muname" like ('%' || 'fine sandy loam' || '%') then 'fine sandy loam'
WHEN "muname" like ('%' || 'rocky sandy loams' || '%') then 'rocky sandy loam'
WHEN "muname" like ('%' || 'rocky sandy loam' || '%') then 'rocky sandy loam'
WHEN "muname" like ('%' || 'cobbly sandy loam' || '%') then 'cobbly sandy loam'
WHEN "muname" like ('%' || 'sandy loams' || '%') then 'sandy loam'
WHEN "muname" like ('%' || 'sandy loam' || '%') then 'sandy loam'
WHEN "muname" like ('%' || 'rocky loam' || '%') then 'rocky loam'
WHEN "muname" like ('%' || 'Rock outcrop' || '%') then 'rock outcrop'
WHEN "muname" like ('%' || 'gravelly loamy fine sand' || '%') then 'gravelly loamy fine sand'
WHEN "muname" like ('%' || 'loamy fine sand' || '%') then 'loamy fine sand'
WHEN "muname" like ('%' || 'loamy coarse sand' || '%') then 'loamy coarse sand'
WHEN "muname" like ('%' || 'Loamy alluvial land' || '%') then 'loamy alluvial land'
WHEN "muname" like ('%' || 'loamy sand' || '%') then 'loamy sand'
WHEN "muname" like ('%' || 'loam sand' || '%') then 'loamy sand'
WHEN "muname" like ('%' || 'gullied land' || '%') then 'gullied land'
WHEN "muname" like ('%' || 'gravelly loam' || '%') then 'gravelly loam'
WHEN "muname" like ('%' || 'cobbly loam' || '%') then 'cobbly loam'
WHEN "muname" like ('%' || 'cobbly clay' || '%') then 'cobbly clay'
WHEN "muname" like ('%' || 'Clayey alluvial land' || '%') then 'clayey alluvial land'
WHEN "muname" like ('%' || 'clay loam' || '%') then 'clay loam'
WHEN "muname" like ('%' || 'clay' || '%') then 'clay'
WHEN "muname" like ('%' || 'arents, loamy' || '%') then 'loam'
```

```
WHEN "muname" like ('%' || 'loams' || '%') then 'loam'
WHEN "muname" like ('%' || 'loam' || '%') then 'loam'
WHEN "muname" like ('%' || 'sand' || '%') then 'sand'
WHEN "muname" is 'Dam' or "muname" is 'Dams' then 'Dam'
WHEN "muname" like ('Urban land' || '%') then 'urban land'
else "muname"
```

Soil dataset was then clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of the areas the percentage of area covered by each groupedsoil texture was calculated.

Elevation

Elevation information is extracted from Digital Elevation Model (DEM) data files retreived from US Geological Survey (U.S. Geological Survey, 2018a)(U.S. Geological Survey, 2018b)(U.S. Geological Survey, 2018c)(U.S. Geological Survey, 2018d). DEM files were mereged to obtain the coverage of the study area (South Coast AVA). Elevation units in the original data were meters so values were converted to feet. Converted raster dataset was clipped to extract areas of existing Southern California AVAs using South Coast AVA borderline ESRI shape file, Temecula Valley AVA borderline ESRI shape file, Ramona Valley AVA borderline ESRI shape file, San Pasqual Valley AVA borderline ESRI shape file and in this document proposed San Luis Rey AVA borderline ESRI shape file. For each of these areas a basic statistic of the cell values within the area was calculated.

Slope

Slope was calculated from DEM data files retreived and extracted as described in Appendix 1, Slope.

Land Use

Land Use data was retrieved from the Regional GIS Data Warehouse at San Diego Association of Governments (SANDAG) services (SANDAG Data, Analytics, and Modeling Department, 2018). Data set was last updated in 2018 using aerial photography, the County Assessor Master Property Records file, and other ancillary information. SANDAG uses four digit codes and 127 classes which were reclassified for the purpose of this document. Original SANDAG land use types were reclassified into 11 classes with purpose to distinguish agricultural land use (intense agriculture, orchards or vineyards) and land use that can potentially be planted with grapevines (rural residential) from other land use types (Table 19).

Table 19. SANDAG landuse definitions with reclassification code

LUCODE	DESCRIPTION	DEFINITION	Reclass. Code
1000	Spaced Rural Residential	Single family homes located in rural areas with lot sizes greater than 1 acre. Rural residential estates may have small orchards, fields or storage buildings associated with the residential dwelling unit however the primary land use is residential in nature.	10
1090	Spaced Rural Residential Without Units	Parcels of land that do not contain a dwelling unit, which are associated with other Spaced Rural Residential parcels, in which land use is residential serving. Includes but not limited to strips of land adjacent to developed land. May include land where a building straddles multiple parcels but the units are clustered over a subset of the parcels.	10
1100	Single Family Residential		20
1110	Single Family Detached	A single-unit structure detached from any other house, that is, with open space on all four sides. Such structures are considered detached even if they have an adjoining shed or garage. Newer developments may include clubhouses, recreation areas, pools, tennis, etc. located within and associated with the residential development, if a separate parcel polygon does not exist. Mobile homes to which one or more permanent rooms have been added or built are also included.	20
1120	Single Family Multiple-Units	A single-unit attached structure that has one or more walls extending from ground to roof separating it from adjoining structures. Examples include row houses, townhouses, and duplex/triplex developments. Newer developments may include clubhouses, recreation areas, pools, tennis, etc. located within and associated with the residential development, if a separate parcel polygon does not exist.	20
1190	Single Family Residential Without Units	Parcels of land that do not contain a dwelling unit, which are associated with other Single Family Residential parcels, in which land use is residential serving. Includes but not limited to strips of land adjacent to developed land. May include land where a building straddles multiple parcels but the units are clustered over a subset of the parcels.	20
1200	Multi-Family Residential	Multiple dwelling units contained on a single floor. Examples include rental apartments and single-floor condominiums (in general, more than 12 units per acre). Newer developments may include clubhouses, recreation areas, pools, tennis, etc. located within and associated with the residential development, if a separate parcel polygon does not exist.	20
1280	Single Room Occupancy	For Rent SROs provide small, fully furnished rooms with utilities included, and rent on daily, weekly, and monthly terms. Does not fit the definition of group quarters.	20
1290	Multi-Family Residential Without Units	Parcels of land that do not contain a dwelling unit, which are associated with other Multi-Family Residential parcels, in which land use is residential serving. Includes but not limited to strips of land adjacent to developed land. May include land where a building straddles multiple parcels but the units are clustered over a subset of the parcels.	20
1300	Mobile Home Park	Includes mobile home parks with 10 or more spaces that are primarily for residential use. (RV parks which are intended for short term use are included within the commercial recreation category).	20
1400	Group Quarters	Group living accommodations. There are two types of group quarters: Institutional (such as correctional facilities, nursing homes, or mental hospitals) and Non-Institutional (such as college dormitories, military barracks, group homes, missions, or shelters).	30
1401	Jail/Prison		30
1402	Dormitory	School associated group living accommodations. Must be counted toward the total student housing for the school. Private housing targeted to students is not considered a dormitory.	30
1403	Military Barracks	Group living accommodations for military personnel. Does not include family or apartment-style housing located on-base.	30
1404	Monastery		30
1409	Other Group Quarters Facility	Convalescent or retirement homes not associated with or within a health care facility, fraternities/sororities, rooming houses, half-way houses, California Conservation Corps, Honor Camps, and other correctional facilities.	30

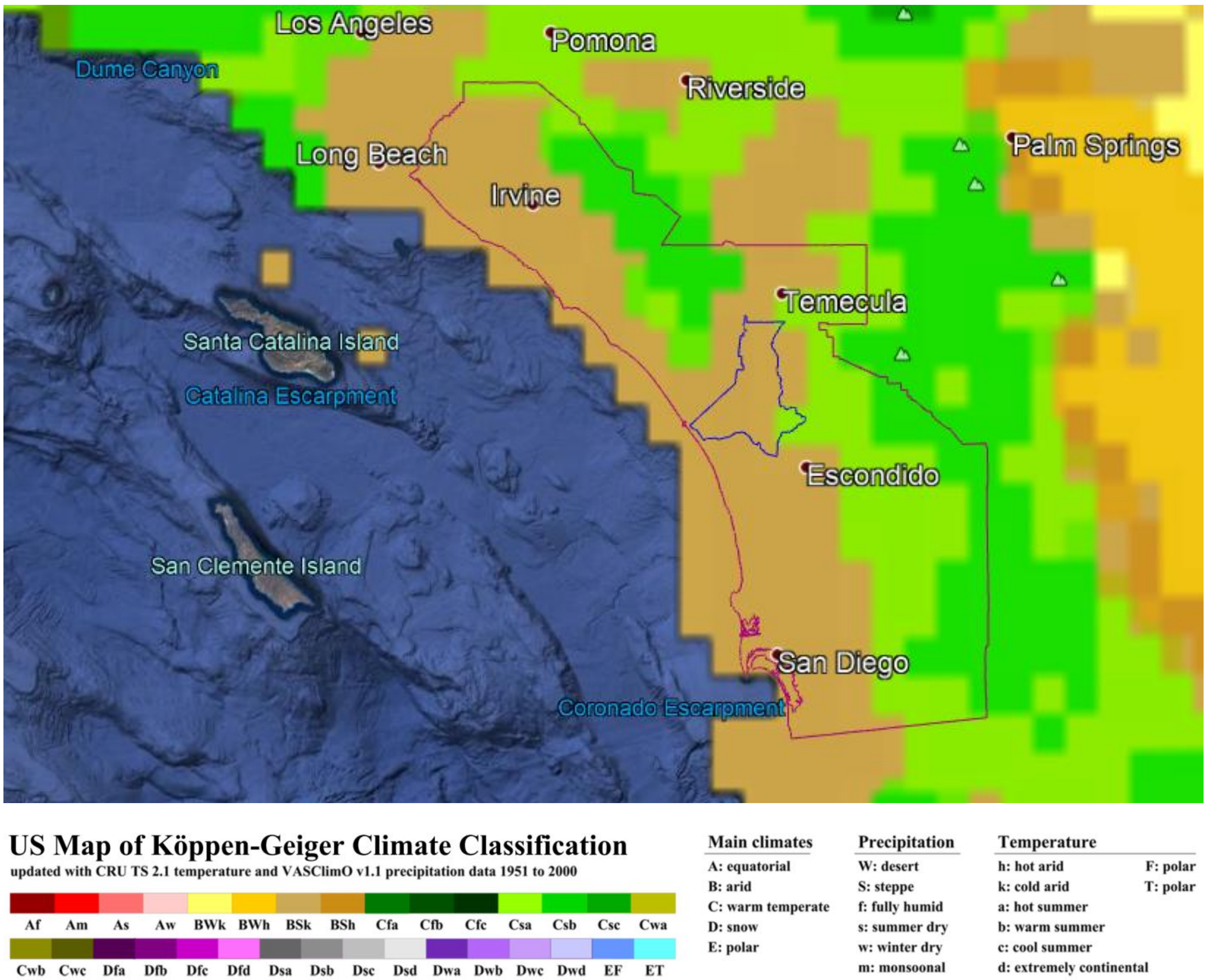
1500	Hotel/Motel/Resort		30
1501	Hotel/Motel (Low-Rise)	Hotels, motels, and other transient accommodations with three or less floors. Commonly found along freeways and prime commercial areas.	30
1502	Hotel/Motel (High-Rise)	Hotels and motels that have four or more floors. Primarily found in downtown areas and near tourist attractions.	30
1503	Resort	Resorts with hotel accommodations that usually contain recreation areas. Examples of resorts would be La Costa Health Spa, Lawrence Welk, and the Olympic Resort in Carlsbad near the airport.	30
2000	Heavy Industry		40
2001	Heavy Industry	Shipbuilding, airframe, and aircraft manufacturing. Usually located close to transportation facilities and commercial areas. Parcels are typically large, 20-50 acres.	40
2100	Light Industry		40
2101	Industrial Park	Office/industrial uses clustered into a center. The primary uses are industrial but may include high percentages of other uses in service or retail activities.	40
2103	Light Industry - General	All other industrial uses and manufacturing not included in the categories above. These are not located inside of parks, but are usually along major streets or clustered in certain areas. Includes manufacturing uses such as lumber, furniture, paper, rubber, stone, clay, and glass; as well as light industrial uses as auto repair services and recycling centers. Mixed commercial and office uses (if not large enough to be identified separately) are also included. General industrial areas are comprised of 75 percent or more of industrial uses (manufacturing, warehousing, and wholesale trade).	40
2104	Warehousing	Usually large buildings located near freeways, industrial, or strip commercial areas.	40
2105	Public Storage	Public self-storage buildings are typically long, rectangular and closely spaced. Also includes RV storage areas.	40
2200	Extractive Industry		40
2201	Extractive Industry	Mining, sand and gravel extraction, salt evaporation.	40
2300	Junkyards/Dumps/Landfills		40
2301	Junkyard/Dump/Landfill	The landscape should show visible signs of the activity. Also include auto wrecking/dismantling and recycling centers.	40
4100	Airports		40
4101	Commercial Airport	Lindbergh Field only.	40
4102	Military Airport	Airports owned and operated by the military. Found on Military bases.	40
4103	General Aviation Airport	All general aviation airports.	40
4104	Airstrip		40
4110	Other Transportation		40
4111	Rail Station/Transit Center	Major transit centers (e.g. Oceanside Transit Center, El Cajon Transit Center), rail stations (e.g. Santa Fe Depot, Solana Beach Station), Coaster stations (Oceanside, Carlsbad Village, Carlsbad Poinsettia, Encinitas, Solana Beach, Sorrento Valley, Old Town, San Diego), major trolley stations, and seaport terminals (Port of SD). Parking areas associated with these uses are included. Transit centers within shopping centers are included within the shopping center category.	40
4112	Freeway	Divided roadways with four or more lanes, restricted access, grade separations, and rights of way greater than 200 ft. wide. Includes all right of way and interchange areas, but not frontage roads.	40
4113	Communications and Utilities	TV and radio broadcasting stations, relay towers, electrical power generating plants, water and sewage treatment facilities, and large public water supply storage tanks.	40
4114	Parking Lot - Surface	All surface parking lots not associated with another land use.	40
4115	Parking Lot - Structure	All large parking structures not associated with another land use.	40
4116	Park and Ride Lot	Stand-alone parking areas that are not associated with any land use. These are usually located near freeways.	40
4117	Railroad Right of Way	All railroad ROWs.	40
4118	Road Right of Way	All street ROWs.	40
4119	Other Transportation	Maintenance yards and their associated activities, transit yards and walking bridges.	40
4120	Marine Terminal	National City and 10th Street (Centre City) marine terminals.	40
5000	Commercial		40
5001	Wholesale Trade	Usually located near transportation facilities. Structures are usually	40

		large and cover the majority of the parcel. Examples are clothing and supply. Also includes swap meet areas.	
5002	Regional Shopping Center	Contain one to five major department stores, and usually have more than 50 tenants. Typically are larger than 40 acres in size.	40
5003	Community Shopping Center	Smaller in size than the regional shopping centers. Contain a junior department store or variety store (i.e. a Target Center with other commercial stores) as a major tenant and have 15 to 50 other tenants. Smaller in size, 8 to 20 acres. May also have a variety store (i.e. Target, Home Depot, or Price/Costco) by itself.	40
5004	Neighborhood Shopping Center	Usually less than 10 acres in size with on-site parking. Includes supermarket and drug store centers not identified as community commercial. May include office uses that are not large enough to code separately. Neighborhood centers with over 100,000 sq. ft. are inventoried by the Chamber of Commerce, and The Union Tribune (Copley) also collects data on neighborhood centers.	40
5005	Specialty Commercial	Tourist or specialty commercial shopping areas such as Seaport Village, Marina Village, Ferry Landing at Coronado, Bazaar del Mundo, Flower Hill, Glasshouse Square, The Lumberyard, Park Plaza at the Village, Promenade, Belmont Park, Del Mar Plaza.	40
5006	Automobile Dealership	Includes National City Mile of Cars and Carlsbad Car Country, among others.	40
5007	Arterial Commercial	Includes commercial activities found along major streets (not in planned centers), with limited on-site parking. May include mixed office uses that are not large enough to be identified as a separate area. Also may include mixed residential uses, i.e. residential on top of commercial or residential units adjacent to commercial establishments.	40
5008	Service Station	Includes gasoline service stations and associated convenience store on stand-alone parcels where it is the primary use.	40
5009	Other Retail Trade and Strip Commercial	Other retail land uses not classified above.	40
6000	Office		40
6001	Office (High-Rise)	High rise buildings with more than four stories containing banking, offices for business and professional services (finance, insurance, real estate), some retail activities and restaurants.	40
6002	Office (Low-Rise)	Low rise buildings with less than five stories containing banking, offices for business and professional services (finance, insurance, real estate), some retail activities and restaurants.	40
6003	Government Office/Civic Center	Large government office buildings or centers (outside of military reservations) and civic centers, or city halls of local governments. Also includes the Chamber of Commerce buildings and DMV Offices.	40
6100	Public Services		40
6101	Cemetery		40
6102	Religious Facility		40
6103	Library		40
6104	Post Office		40
6105	Fire/Police Station		40
6108	Mission		40
6109	Other Public Services	Cultural facilities, museums, art galleries, social service agencies, humane societies, historic sites, and observatories.	40
6500	Hospitals		40
6501	UCSD/VA Hospital/Balboa Hospital		40
6502	Hospital - General	Hospitals not included above.	40
6509	Other Health Care	Medical centers and buildings or offices, health care services, and other health care facilities. Smaller medical offices and facilities may be included within office, strip commercial, or other surrounding uses.	40
6700	Military Use		40
6701	Military Use	Defense installations, operational facilities, maintenance facilities (non-weapons), research and development, supply and storage (non-weapons), community support facilities and any other military use that does not fall in other categories.	40
6702	Military Training	Academic, operational and combat training facilities, training ranges, and special purpose training ranges.	40
6703	Weapons Facility	Weapons assembly, maintenance and storage facilities.	40
6800	Schools		40

6801	SDSU/CSU San Marcos/UCSD		40
6802	Other University or College		40
6803	Junior College	Includes trade or vocational schools.	40
6804	Senior High School		40
6805	Junior High School or Middle School		40
6806	Elementary School		40
6807	School District Office		40
6809	Other School	Includes adult schools, non-residential day care, and nursery schools.	40
7200	Commercial Recreation		40
7201	Tourist Attraction	Sea World, Zoo, and Wild Animal Park, Legoland.	40
7202	Stadium/Arena	Sports Arena, San Diego Stadium, and Petco Park.	40
7203	Racetrack	Del Mar, San Luis Rey Downs.	40
7204	Golf Course	Public and private golf courses.	40
7205	Golf Course Clubhouse	Clubhouses, swimming and tennis facilities, and parking lots associated with the golf course.	40
7206	Convention Center	Centre City, Embarcadero.	40
7207	Marina	Includes marinas such as Oceanside Harbor, Quivira Basin, Shelter Island, Harbor Island, Embarcadero, and Chula Vista marina.	40
7208	Olympic Training Center	Olympic Training Center in Chula Vista	40
7209	Casino	Gambling establishments, typically located on Indian Reservations.	40
7210	Other Recreation - High	High intensity uses primarily in urban areas. Drive-in theaters, fitness clubs, boys/girls clubs, YMCA's, swim clubs, and stand-alone movie theaters. Also includes tennis clubs without golf, rodeo grounds, and senior recreation centers.	40
7211	Other Recreation - Low	Campgrounds and other low intensity recreation. Includes public and private primitive and developed camping areas for tents and RVs. Also includes camps and retreat centers owned or used by religious organizations, scouting, or YMCA. Other low intensity uses such as rifle ranges are included.	40
7600	Parks		50
7601	Park - Active	Recreation areas and centers containing one or more of the following activities: tennis or basketball courts, baseball diamonds, soccer fields, or swings. Examples are Robb Field, Morley Field, Diamond Street Recreation Center, and Presidio Park. Smaller neighborhood parks with a high level of use are also included as active parks.	50
7603	Open Space Park or Preserve	Wildlife and nature preserves, lands set aside for open space, and parks with limited development and access. Examples are Torrey Pines State Reserve, Penasquitos Canyon Reserve, San Elijo Ecological Preserve, and Nature Conservancy properties.	50
7604	Beach - Active	Accessible sandy areas along the coast or major water bodies (San Diego and Mission Bay) allowing swimming, picnicking, and other beach related recreational activities. Usually has parking associated with it.	50
7605	Beach - Passive	Other sandy areas along the coastline with limited parking and access (beaches along cliffs, or near preserves).	50
7606	Landscape Open Space	Actively landscaped areas within residential neighborhoods such as greenbelt areas and hillsides with planted vegetation (trees/shrubs), among others.	50
7607	Residential Recreation	Active neighborhood parks that are for the use of residents only such as fenced in areas that may contain pools, tennis and basketball courts, barbecues, and a community meeting room.	50
7609	Undevelopable Natural Area	* Planned land-use only - Undevelopable natural areas that are not part of an established open space park or preserve. Examples are Cleveland National Forest and open space easements around developments.	60
8000	Agriculture		70
8001	Orchard or Vineyard		71
8002	Intensive Agriculture	Nurseries, greenhouses, flower fields, dairies, livestock, poultry, equine ranches, row crops, and grains.	70
8003	Field Crops	Also includes pasture and fallow land.	70
9100	Vacant and Undeveloped Land	* Historical and Existing only	80
9101	Vacant and Undeveloped Land		80
9200	Water		90
9201	Bay or Lagoon		90

9202	Lake/Reservoir/Large Pond		90
9300	Tribal Land	* Planned land-use only	93
9400	Public/Semi-Public	* Planned land-use only	94
9500	Under Construction	* Historical and Existing only	95
9501	Residential Under Construction	Usually located near existing residential developments.	95
9502	Commercial Under Construction	Usually located near existing commercial or residential areas.	95
9503	Industrial Under Construction	Usually located near existing industrial or commercial developments.	95
9504	Office Under Construction	Usually located near existing industrial or commercial developments.	95
9505	School Under Construction		95
9506	Road Under Construction		95
9507	Freeway Under Construction		95
9600	Specific Plan Area	* Planned land-use only	95
9700	Mixed Use	Vertical mixed-use development with street-level commercial uses and residential and/or office uses above.	97

Appendix 2: Detail from the Köppen -Geiger Climate Classification Map of United States(Kottek, Grieser, Beck, Rudolf, & Rubel, 2017)



Appendix 3: Population density, North San Diego County(Dion-Watson, 2014)