USING GIS TO ASSESS THE TERROIR POTENTIAL OF AN OREGON VITICULTURAL REGION

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Deciding to grow grapes in Oregon is complex issue due to our diverse geography, climate, and relatively short history of grape growing. For any potential grape grower, vineyard site selection is the single most important decision they will face. Combined with matching the site to a grape variety, this decision will ultimately affect the vineyard's yield, the quality of the wine produced, and the vineyard's long-term profitability. This research facilitates the process by modeling the climate and landscape in a relatively young grape growing region in Oregon, the Umpqua Valley American Viticultural Area (AVA). The result is an inventory of land suitability that provides both existing and new growers greater insight into the best terroir of the region.

A field survey using a Global Positioning System (GPS) and a varietal survey were conducted covering all of the vineyards in the Umpqua Valley AVA. The results have described the locational factors important for vineyard layout, training methods, soil types, irrigation and frost uses, and phenological variability across the region. Using the locational information from the surveys of existing vineyards as the baseline, a digital elevation model (10m resolution) was analyzed for topographical components of elevation, slope, and aspect, ultimately identifying those sites that have ideal conditions for growing grapes in the region. The topographical classifications are then combined with soil characteristics of drainage, depth to bedrock, water holding capacity, and pH to produce a composite landscape model of suitability which is then masked by zoning requirements to identify the best available sites. In addition, a composite climate model, derived from the PRISM gridded data, develops cool, intermediate, warm, and hot climate-maturity groupings based on ripening potential and multiple climate parameters important for winegrape production. Finally, the composite landscape and climate models are then combined to detail the best terroir for specific varietal groupings in the Umpqua Valley AVA.

Combining topography, soil, and land use finds over 3000 acres of nearly ideal landscapes that are suitable for vineyard development. The results indicate that very good landscapes exist across all climate maturity types with strong potential for future development and production of quality fruit and wines. Through the use of GPS and GIS technologies, this research has helped to further define the terroir potential of grape growing in the Umpqua Valley AVA. The results provide existing and future growers with baseline knowledge of the region's grape growing potential relative to its topography, soil, land use, and climate. While not specifically addressing the cultural aspects of terroir (e.g., style-directed viticultural and enological practices), which typically take many years to become dominant, the results presented here should serve to initiate better decisions in the site selection process, thus leading to fewer and/or more efficient trial and error procedures. In addition, for most potential growers, site selection will involve compromises, in that few sites will possess ideal characteristics in every respect. While compromise in many cases has been the rule, this body of research presents one of the best tools yet to enhance the site selection process for future growers in the Umpqua Valley AVA. Finally, the process developed here theoretically can be applied to any area where adequate spatial data resources are available.