Virginia Wine Board Grant
Final Report

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Title: Virginia Vineyard Site Assessment
Proposal Number: 22-23 VWB
Project Type: Research
Is this a multi-year grant? No
Original Funding Amount: [$52,500.00]
Remaining Balance: [$2500.00]

Objectives and Results:

We have designed and developed a new web portal and services for a next generation web-based platform maintained by Satellite Arts LLC in order to support the robust wine industry ecosystem in Virginia, and to help Virginia wineries set the pace for the industry. The site assessment tool provides the ability to request a site analysis report for a specific geographic area of interest in Virginia, usually a parcel of land. The resulting report provides a summary and analysis of the climate, soils, and topography for the site, and information on the potential for varietal fit to the site by evaluating basic growing season requirements for a set of varietals that are commonly grown and emerging in Virginia. The public launch date for the tool is planned for February 20, 2024, coinciding with the VVA Winter Technical meeting in Charlottesville, Virginia.

Calibration and Validation of the weather/climate models, varietal recommendations using observations and measurements in Virginia was accomplished using prior data from known vineyard sites in Virginia and previous viticultural information provided by Virginia Cooperative Extension and individuals. The climate data has been updated to incorporate the latest IPCC scenarios for future climate projections, and the Oak Ridge National Labs Daymet v4 data for historical climate data.

Development of new metrics and models for site assessment was accomplished through the compilation of spatio-temporal climate data including minimum and maximum daily temperature, precipitation, relative humidity, and atmospheric pressure. These variables, along with variables from soil and topographic databases, are used to produce numeric indexes that are standard in the viticulture industry such as Average Growing Season Temp, Growing Degree-days, Heating Degree Days, Cooling Degree Days, Heliothermal Index (Huglin), BEDD, Biologically effective degree days (Gladstones), Spring Frost Index, Fall Frost Index, Summer Heat Index,

Precipitation Index, potential Cold Air Drainage areas, Growing season average maximum (Jones), Growing season average minimum (Jones), Ripening period average temperature (Jones) August15 to October 15, Last date of spring frost, First date of fall frost, Length of frost free period, slope and aspect, location relative to American Viticultural Areas, Depth to bedrock, pH, Available water holding capacity, Land Cover, Soil drainage, Soil organic matter, and Cation exchange capacity.

We experienced some delays over the course of the project. Primarily, these were technical delays due to incompatibility issues with the cloud platform and the technical standards available for large amounts of geospatial data that needs to be prepared and stored for the site assessment tools. In March 2023, the project made a decision to switch from Amazon Web Services hosting to Microsoft Azure hosting. This will provide a more robust and economical approach for sustainability of the cloud-based hosting and services, and aligns with the current platform expertise of Satellite Arts LLC.

Overall Benefit for Virginia Wine Industry:

Many of the conditions for the ongoing success of the Virginia wine industry are in place. This project continues an innovative approach to incorporate and transcend the current state of the art for vineyard site assessment that is available to Virginia wineries and winegrape growers. Virginia as an early adopter will provide a strong foundation and advantage for the evolution of producer and consumer experiences and quality and marketability of Virginia wineries. The platform is also positioned to incorporate additional information, including market data to further aid in the decision of which varieties to plant, when and where to plant in anticipation of climate and market trends. The funding for this project also helps to retain key expertise in geospatial winegrape suitability mapping that has been supported over the past 15+ years in Virginia through previous Virginia Wine Board, USDA, NSF, and commercial projects.

Publications and Activities Associated with Project:

The site assessment tool will launch to the public in February 2024, and the web domain geovine.org will automatically forward to a new web domain and web-based platform. We anticipate and encourage further promotion of the resources through webinars, invited talks, blogs, podcasts and exhibits at industry events. As the site assessment tools gain traction, we plan to provide regular updates on the enhancements to the platform.

Future Work:

The funding from the Virginia Wine Board has made possible the development of this resource, and represents progress towards a self-sustaining funding model that is independent of regular, ongoing support from the VWB. The platform is well positioned for scalability to incorporate additional climatic, edaphic and varietal parameters and models over time. The process of updating the web portal includes research and engagement with industry to improve viticultural and enological practices in the Virginia wine industry. The platform is also geographically

scalable to other markets as well including major US and international winegrape growing regions. Satellite Arts will continue to work with the organizations and individuals in the wine industry, governments and academia to remain on the cutting edge of site assessment and selection.

Final Budget and Justification:

Item Type	Original Awarded Amount	Final Amount Spent
Personnel		
Fringe		
Travel	$2500	$0
Supplies & Materials		
Contractual	$50,000	$50,000
Other		
Total	$52,500	$50,000

The original budget for this project was funded at the amount of $52,500.00, which included $2500 for travel. The $2500 was not utilized during the period or performance and is not billed accordingly.

References:

- Vineyard Site Selection https://vtechworks.lib.vt.edu/bitstream/handle/10919/50983/463-020_pdf
- Agronomy 2019, 9(12), 783; https://doi.org/10.3390/agronomy9120783