CONSERVATION INNOVATION GRANTS
FINAL Progress Report

Grantee Name: California Sustainable Winegrowing Alliance	
Project Title: Driving Conservation Innovation and Sustainable Winegrowing Adoption through Performance Benchmarking, Tools, and Resources (NRCS CIG 69-3A75-9-146)	
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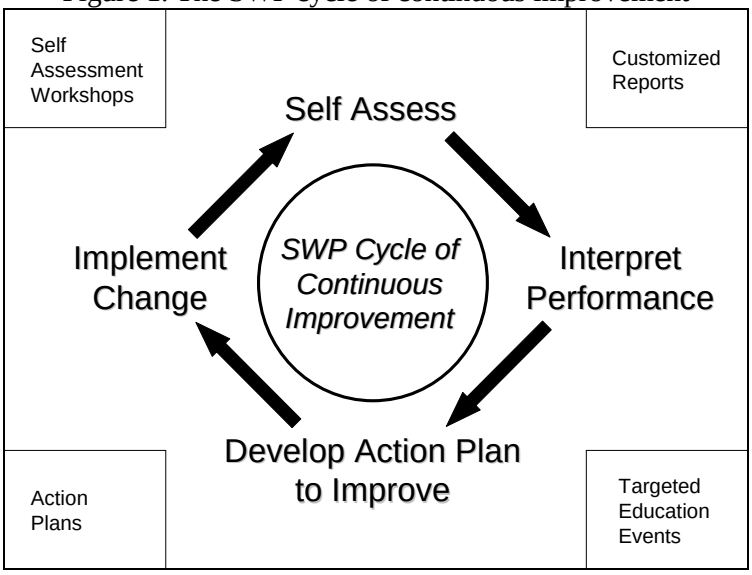
Period Covered by Final Report: October 1, 2009 – September 18, 2013	
Project End Date: September 18, 2013	

Summary of Project Activities:

The California Sustainable Winegrowing Program (SWP) began in 2001 as an initiative to promote and adopt "ground to bottle" sustainable practices for producing grapes and wine. Leadership is provided by the California Sustainable Winegrowing Alliance (CSWA), a non-profit organization represented by the two major statewide associations affiliated with California grapes and wine – Wine Institute and the California Association of Winegrape Growers. SureHarvest, a sustainability services and software company, has assisted with the design and implementation of SWP since its inception.

The CSWA advocates winegrowing operations that balance the three E's or principles of sustainability – **E**nvironmentally Sound, Socially **E**quitable, and **E**conomically Feasible. To positively change grower and vintner behavior, SWP relies on its iterative self-improvement model (Figure 1), the "cycle of continuous improvement," designed to ensure confidentiality, extensive voluntary participation, and collective progress in adopting more sustainable practices. The cycle involves self-assessment, the interpretation of performance, action planning, and the implementation of change. An extensive partnership network helps facilitate these interrelated activities. A third-party certification of sustainable winegrowing based on cycle elements is widely used.

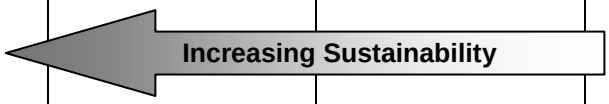
Figure 1. The SWP cycle of continuous improvement



The cycle's centerpiece is the *Code of Sustainable Winegrowing Practices Self-Assessment Workbook*; third edition released in 2012. The Workbook covers farming and winemaking practices over 15 chapters – Sustainable Business Strategy, Viticulture, Soil Management, Vineyard Water Management, Pest Management, Wine Quality, Ecosystem Management, Energy Efficiency, Winery Water Conservation and Quality, Material Handling, Solid Waste Reduction and Management, Environmentally Friendly Purchasing, Human Resources, Neighbors and Community, and Air Quality. Each chapter includes criteria (management areas) for evaluating practices using a four-category scale (Table 1). Most participants use the SWP online system at www.sustainablewinegrowing.org to complete assessments and generate reports for tracking their performance and comparing to regional and state averages. Staff for the CSWA enters data and provides reports for those submitting paper assessments. Individualized reports constitute the framework for evaluation and improvement. Vineyard and winery practitioners accountable for about 70% of California's winegrape acreage and wine case production have assessed their operations.

Table 1. Criterion 16-6 from the Air Quality chapter exemplifying the four-category measurement system

AIR QUALITY				
Criteria	**Category 4**	**Category 3**	**Category 2**	**Category 1**
16-6 Pesticide Stewardship	Recommended practices were followed to minimize PM_{10} and drift* from dust (e.g., sulfur) and liquid applications ***And*** Pesticides associated with higher VOC emissions were known or determined and avoided for use (see **Box 16-M**) ***And*** Applicators were trained about pesticide issues relevant to air quality.	Recommended practices were followed to minimize PM_{10} and drift* from dust (e.g., sulfur) and liquid applications ***And*** There was some understanding of pesticide products associated with higher VOC emissions (see **Box 16-M**).	Recommended practices were followed to minimize PM_{10} and drift* from dust (e.g., sulfur) and liquid applications.	Pesticides were chosen and applied without considering impacts to air quality other than following legal requirements.



To complement grower and vintner self-assessment and action planning, the CSWA and partners apply collective self-assessment results to identify areas where education is most needed (i.e., data-driven targeted education). Targeted education is provided by peer-to-peer exchange and presentations by external experts at field meetings, workshops, and seminars.

This National Conservation Innovation Grant (CIG) project (NRCS CIG 69-3A75-9-146) is CSWA's third CIG. The first, NRCS CIG 68-3A75-4-166, improved elements, use, and effectiveness of the SWP behavioral change cycle – especially as related to water and air protection. Enhancements included the production of the second edition of the Workbook with the ground-breaking Air Quality chapter in 2006, and the conversion to the online self-assessment and reporting system with a reporting option for aligning SWP and NRCS practices. Use of the second edition workbook and online system combined with targeted education increased grower participation and performance for most criteria pertinent to water quality and conservation and enabled the initial benchmarking of grower and vintner performance against the air quality criteria.

The second CIG (NRCS CIG 69-3A75-7-86) was used to characterize existing environmental accounting tools for applicability to California winegrowing, user-friendliness, and potential fit for ecosystem

services markets; develop initial phases of an online performance metrics sustainability portal and associated energy and greenhouse gas (GHG) educational tool and calculator adapted from the excel-based International Wine Community Carbon Calculator (Provisor, Australia); introduce winegrowers to performance metrics and have them test and provide feedback on the portal, energy and GHG tool, and IPM Institute of North America's Pesticide Risk Mitigation Engine (PRiME); and provide outreach about the benefits and results of the project to other winegrowers and agricultural industries.

Activities in this third CIG project (NRCS 69-3A75-9-146) were designed to complement existing SWP elements and other CIG projects by constituting a commitment by the California wine industry to adapt, develop, and use environmental performance metrics and associated calculations and educational resources to support individual and collective performance tracking, target setting, and continuous improvement (see page 16 for Project Action Plan and Timeline).

By measuring impacts of practices on environmental parameters (e.g., natural resource use), winegrowers can sort real from perceived performance and convey accurate information to stakeholders; compare their performance to peers; prioritize farm plans and save money through increased efficiencies; meet market demand for transparency of production information; take advantage of market-based incentives, such as GHG and water quality trading programs and energy and water use reduction programs; and potentially benefit from alternative regulatory compliance opportunities. Furthermore, the intent is for CSWA's third-party certification option to require calculations and improvement targets for performance metrics.

Project objectives were:

1) Identify and/or develop 5+ sustainability metrics and associated calculations for winegrowers;
2) Configure SWP online system to calculate and store metrics data and produce benchmark reports;
3) Conduct outreach to 2000+ winegrowers about the customized metrics and calculation methods;
4) Collect and analyze baseline metrics data;
5) Establish statewide metrics improvement targets and timetables;
6) Identify, develop, and convey tools, resources, and key practices to improve metrics performance;
7) Evaluate and report project impact; and
8) Expand project impact by transfer of the implementation process and results to other specialty crops.

The CSWA and SureHarvest executed activities by leveraging experiences from related CIG and other SWP projects and applying respective core strengths in grower education and outreach and in building and managing user-friendly software. Project achievements were expected to increase winegrower participation in SWP and use of its behavioral change cycle, enhancing natural resource conservation and the transferability of the SWP model to other agricultural sectors.

The following details accomplishments by objective over the course of the project, October 1, 2009 – September 18, 2013 (includes no-cost extension).

Objective 1 – Identify and/or develop 5+ sustainability metrics and associated calculations for winegrowers.

This objective was achieved through a process of interactions with individual growers and vintners, academic and private experts, and CSWA leadership. Overall, 30 events (workshops, webinars, and meetings) were held where the logic for calculating and tracking environmental performance metrics was discussed, hands-on experience with metrics calculations occurred, and final options for industry wide application were evaluated and agreed.

An important part of the process was 6 hands-on workshops and webinars where 82 growers and vintners evaluated a California winegrower sustainability portal (Figure 2), which was developed with previous CIG funds and was the predecessor to the existing SWP metrics website. The portal housed an early version of the energy and GHG educational tool and metrics calculator (Figure 3) and linked to IPM Institute of North America's pesticide risks calculator PRiME. In general, participants supported the logic for tracking performance metrics, provided valuable feedback on the design and functions of the portal, energy, GHG, and pesticide risks tools, and recommended other metrics (related to water, fertilizers, biodiversity, human resources, etc.) as candidates for industry use.

Figure 2. Sustainability portal

Figure 3. Training for energy and GHG tool

Final meetings were held with CSWA leadership (SWP Joint Committee, which is made up of approximately 50 growers and vintners, and CSWA Board of Directors) to evaluate candidate metrics and select the initial set for implementation. Discussions were informed by: 1) findings from the hands-on workshops, 2) experiences and metrics associated with the Stewardship Index for Specialty Crops (SISC) – a non-CSWA CIG project to develop common specialty crop performance metrics through a multi-stakeholder process, and 3) feedback from academics and private experts about the credibility, usefulness, and difficulty in securing inputs for and calculating the candidate metrics. Table 2 lists the criteria that were established and used to screen the candidate metrics.

Table 2. Key criteria for selecting performance metrics

• Data availability and ease of use
• $ Value potential
• Environmental benefits
• State of science
• High-profile issues – natural and human resources
• Buyer interest
• Applicable to vineyards and wineries
• Potential fit for ecosystem services markets

The metrics selected were energy use intensity (vineyards and wineries), GHG emissions intensity (vineyards and wineries), water use efficiency (vineyards and wineries), and nitrogen use efficiency (vineyards). Required inputs and calculations are detailed in the text and figures associated with Objective 2. Additional metrics likely will be included in the future.

Objective 2 – Configure online system to calculate and store metrics data and produce benchmark reports.

Execution of project activities resulted in the development of an integrated online platform that serves two functions: 1) enables growers and vintners to calculate metrics and store, print, and graph results; and 2) educates users about metrics and how calculating and tracking them enhances business and environmental value, and relates results to key practices and resources for improving performance. Specifics about the educational features are detailed in the text for Objective 6.

The online platform consists of two interconnecting sites – the performance metrics site and the SWP self-assessment and reporting site. The metrics site provides background on and the logic for calculating metrics, and houses the metrics calculators and displays calculations. In addition to enabling assessments and reporting of vineyard and winery practices, the SWP site has been modified to store and graph metrics results, relate results to on-the-ground practices, and link to relevant resources. Existing SWP participants, who have characterized their vineyard and/or winery organizations for tracking practice-based assessments, can directly access all features of the metric site from the SWP site. New participants can access the Welcome Page on the metrics site but must complete SWP signup procedures and characterize their businesses before gaining access to the metrics site's educational tools and calculators (Figure 4).

The metrics site has pages and calculators for energy and GHG (energy use and GHG emissions intensities), water use (water use efficiency), and nutrient use (nitrogen use efficiency). Users develop profiles per vineyard (Figure 5) and winery so that factors other than operational efficiency affecting results can be identified and "similar facilities" categorized for analyses. For vineyards, the energy and GHG calculator evolved from calculating only energy related Scope 1 and 2 GHG emissions to including soil-related Scope 1 emissions (Figure 6). This was achieved by partnering with Applied GeoSolutions and UC Davis to develop the California vineyard DeNitrification-DeComposition (DNDC) model and link a simplified version of the model to the metrics site. The model accounts for interactions among local climate, soils, and management practices to simulate vine growth and yield, and the emissions and consumption of gases within the soil environment. Management practices selected for vineyard profiles are integrated with historical climate information (CIMIS) and soils data (NRCS Soil Survey) to estimate N_2O emissions, change in soil carbon content (CO_2 emissions minus carbon sequestered), and the total of soil-related GHG emissions for the year simulated. DNDC results are combined with GHG emissions from fuel and electricity to provide cumulative Scope 1 and 2 GHG metrics (see *DNDC Greenhouse Gas Modeling for California Vineyards* in Appendix A). Other pages provide pertinent educational information and calculators for water use efficiency (Figure 7) and nitrogen use efficiency (Figure 8).

Once the vineyard or winery profile is set up, users enter their data (e.g., annual fuel use, annual electricity use, nitrogen applied) directly into the metrics calculators. The metrics site includes hover buttons that provide clear guidance to users on how to collect the required data and worksheets are also available for download within the site to assist users in data collection.

To track and report metrics performance in conjunction with practice-based assessments, results of calculations are transferred to and stored on the SWP site (Figure 9), where educational resources including links to pertinent criteria and practices from the Workbook and other resource links are provided (Figure 10). Because of insufficient sample sizes for calculating representative averages, comparisons of performance for individual vineyards or wineries to statewide and regional averages has not been enabled yet but will be after sufficient data is collected and representative averages are determined. Importantly, however, users already can generate graphs that display internal business performance over years for one or more vineyards or wineries (metrics analysis reports; see text for Objective 6 and Figure 11).

Figure 4. Welcome page on metrics site

Figure 5. Vineyard profile

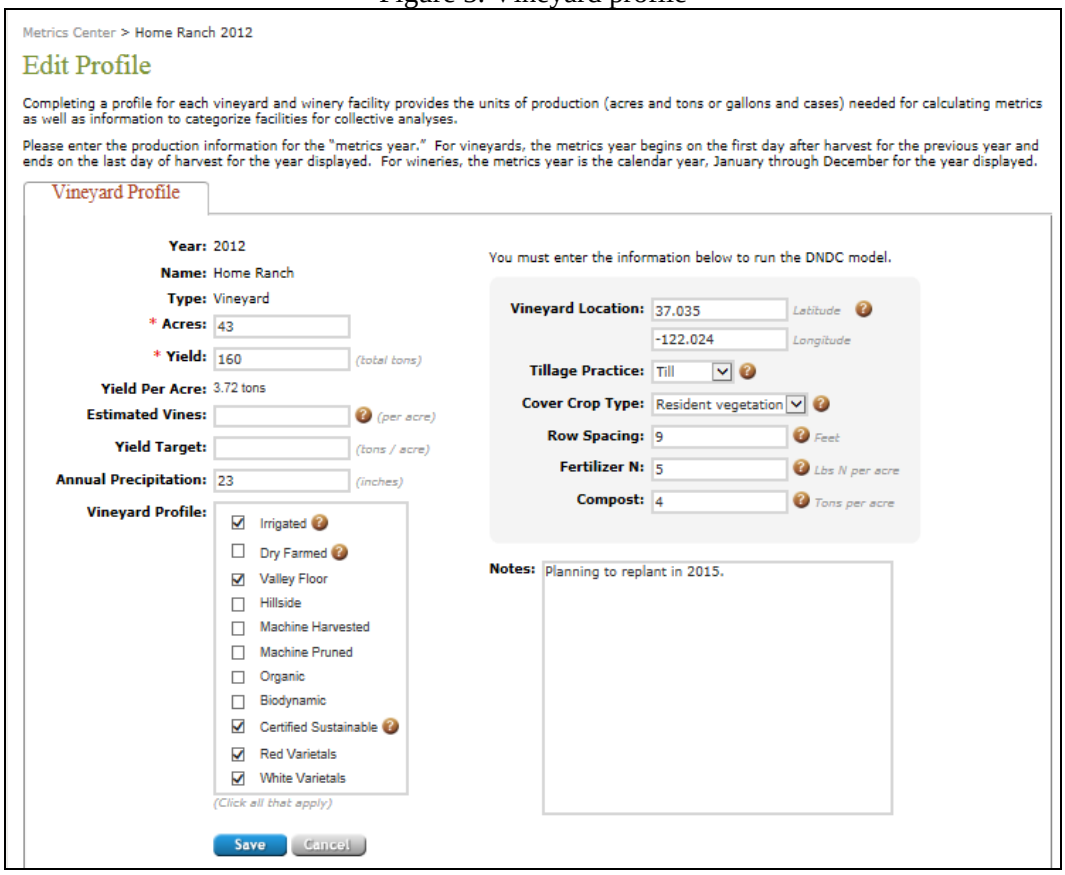


Figure 6. Calculation of energy and GHG metrics

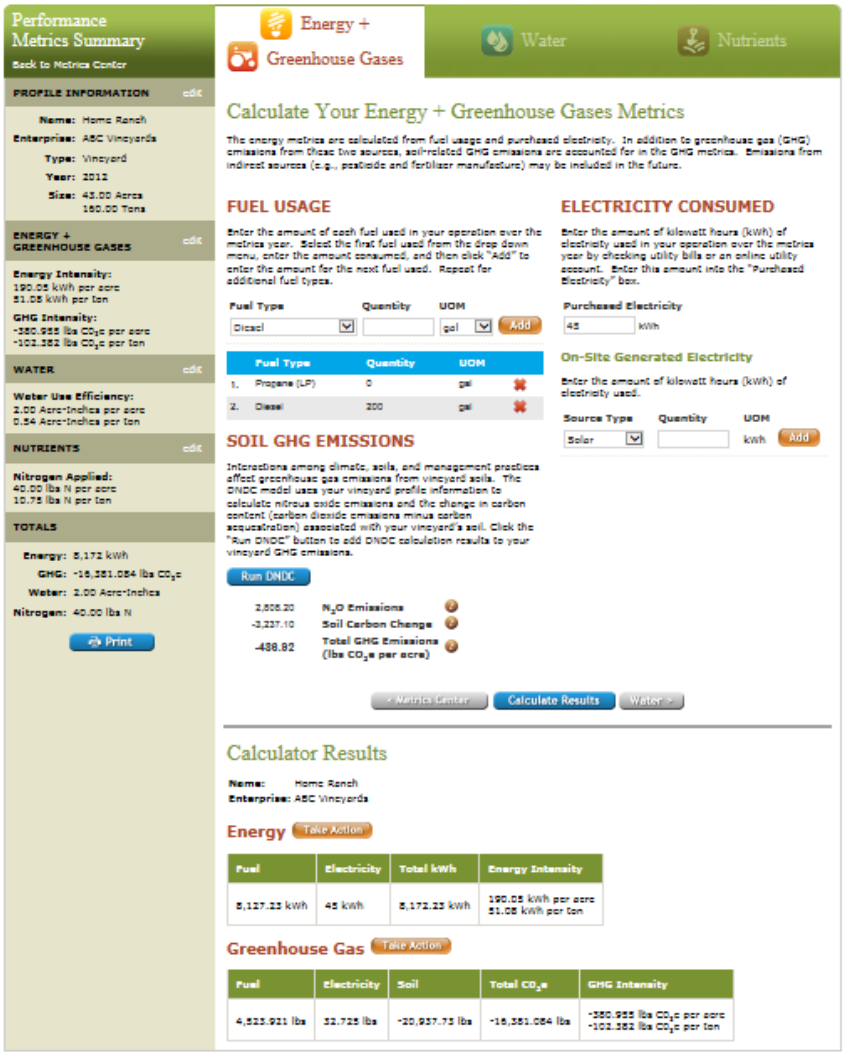


Figure 7. Calculation of water metrics

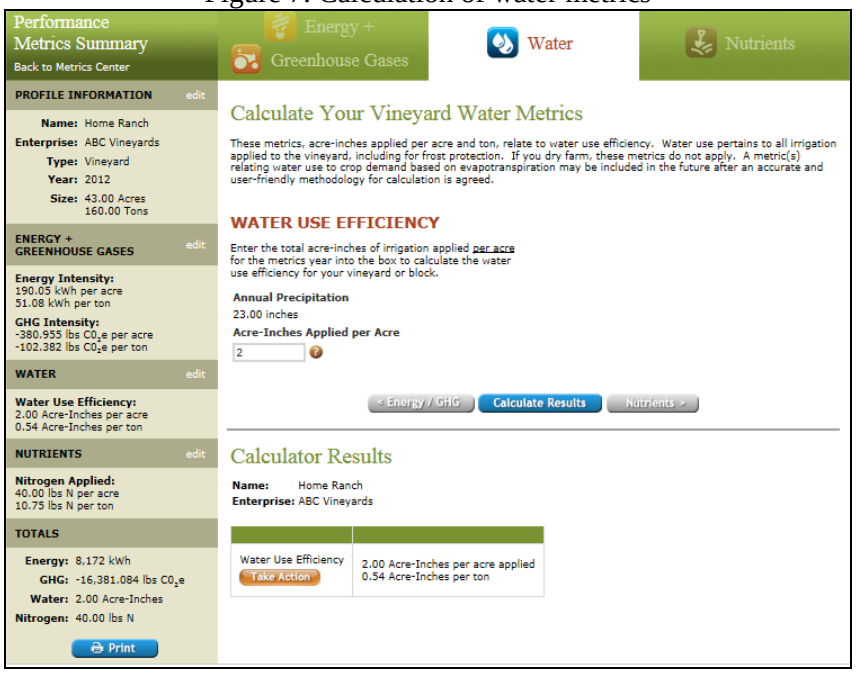


Figure 8. Calculation of nitrogen metrics

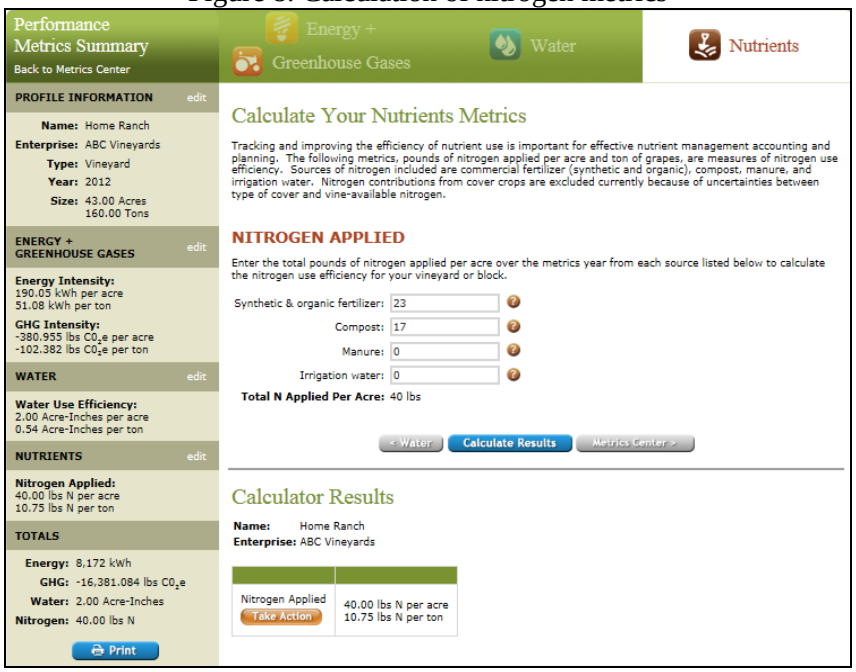


Figure 9. Metrics results on SWP site

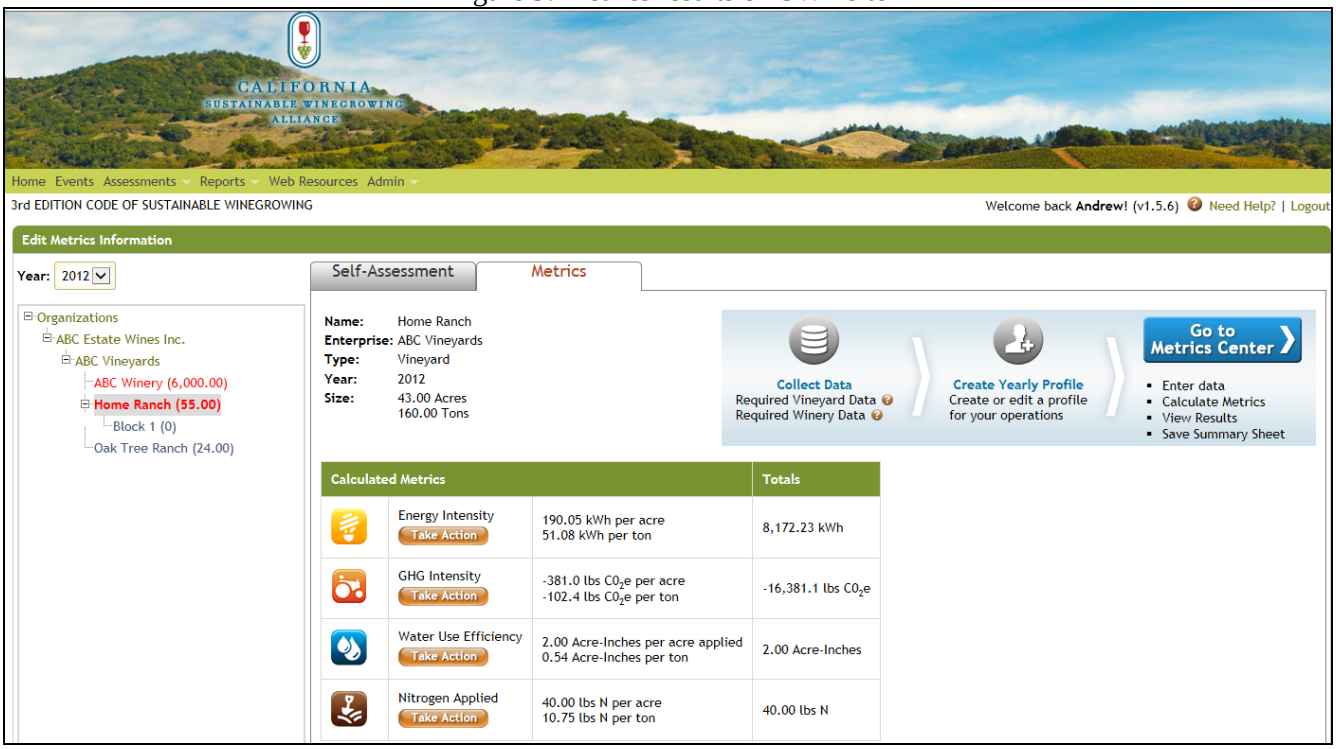
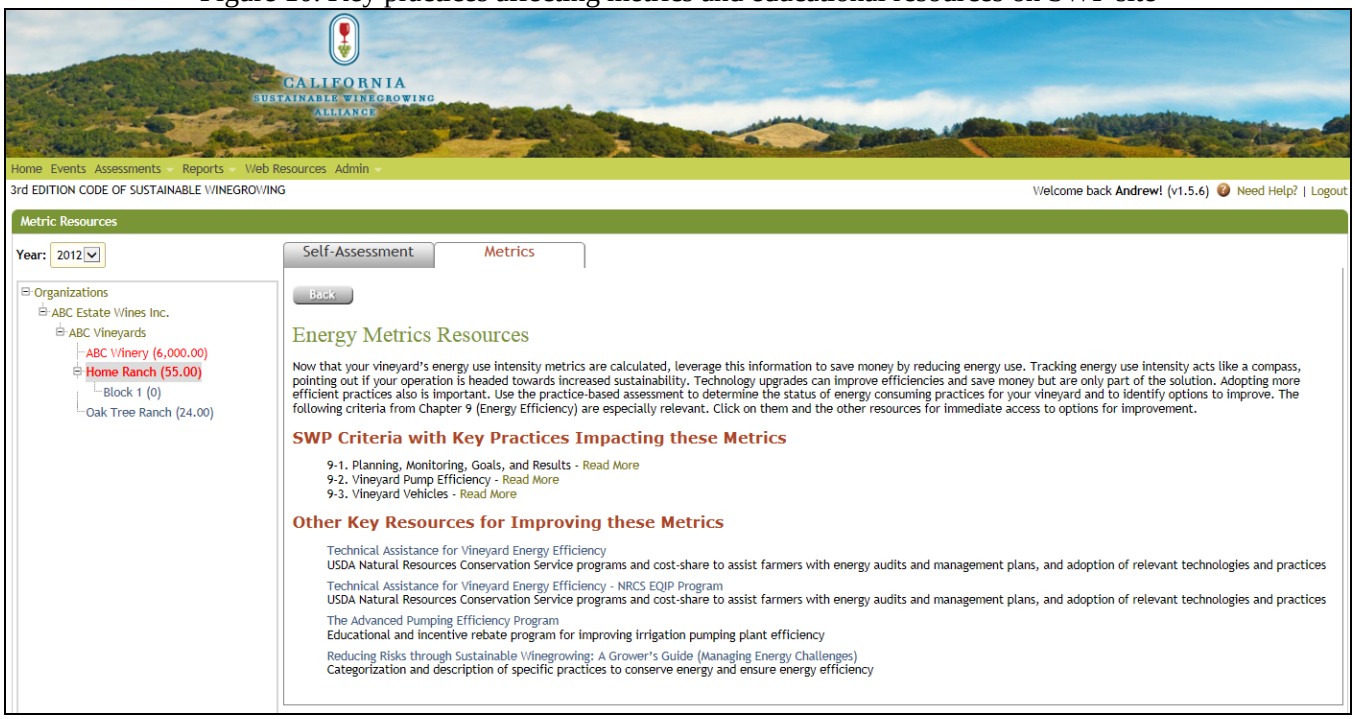


Figure 10. Key practices affecting metrics and educational resources on SWP site



Objective 3 – Conduct outreach to 2000+ growers and vintners about the customized metrics and calculation methods.

Outreach about the project, metrics, and process for using the online platform was provided to more than 6,000 winegrowers via newsletters, press releases, the Web, and other communications. Key outreach materials included in Appendix A, along with the number of winegrowers reached per material, are the CSWA Highlights Newsletter *CSWA to Introduce Performance Metrics for Sustainable Winegrowing*, the Performance Metrics Information Webpage (www.sustainablewinegrowing.org/performance-metrics.php), the press release *CSWA Introduces Performance Metrics to Help Growers and Vintners Measure Water and Energy Use* (www.sustainablewinegrowing.org/articletype/4/Press_Releases.html#80), *Performance Metrics News Briefs*, and the press release *CSWA Introduces Online Tool to Measure Vineyard Greenhouse Gas Emissions* (www.sustainablewinegrowing.org/articletype/4/Press_Releases.html#94).

Additional growers and vintners were alerted via dissemination of outreach materials, presentations, and discussions at numerous winegrower events over the course of the project. Moreover, general presentations about project achievements were made at venues including the Conservation Innovation Grants Showcase (July 17-20, 2011 in Washington, DC), a hosted tour and discussion for NRCS national and statewide leadership (August 25, 2011 at McMurray Ranch in Healdsburg, CA), the Green Wine Summit (November 30, 2011 in Napa, CA), Zenith Insurance's Sustainability Panel (February 9, 2012 in Fresno, CA), and the 7th International IPM Symposium (March 28, 2012 in Memphis, TN).

Objective 4 – Collect and analyze baseline metrics data.

The capture of baseline metrics data commenced with the launch of the integrated online platform (metrics and modified SWP sites) in March 2012. To help growers and vintners use the online features and organize data requirements for calculations (e.g., monthly water consumption), an *SWP Performance*

Metrics Calculator User Guide (see Appendix A) and vineyard and winery metrics spreadsheets were developed and are available on the SWP site.

Twenty two workshops and webinars attended by 348 growers and vintners were held after launch of the online platform to demonstrate its features and inspire participants to calculate and submit metrics data (Table 3). Of these events, 11 included hands-on activities so users could directly experience the metrics calculators and associated educational content. All participants were encouraged to use or continue using the online platform and calculators after the events.

Table 3. Events for environmental performance metrics project and relevance to objectives

Date	**Venue**	**County**	**Collect Metrics Data**	**Targeted Education**	**Participants**
3/5/12	Webinar	Statewide	Beta-testers for calculations		4
3/20/12	Workshop	Sonoma	Hands-on calculations	Water, energy & GHGs	19
4/18/12	Workshop	Lake	Hands-on calculations	Water, energy & GHGs	7
4/24/12	Webinar	Statewide	Metrics demo		3
4/26/12	Webinar	Statewide	Hands-on calculations	Water, energy & GHGs	7
5/22/12	Webinar	Statewide	Hands-on calculations	Water, energy & GHGs	5
5/30/12	Webinar	Statewide	Metrics demo		4
8/3/12	Workshop	SL Obispo	Hands-on calculations	Water, energy & GHGs	24
2/27/13	Webinar	Statewide	Metrics demo		2
3/27/13	Webinar	Statewide	Metrics demo		3
3/28/13	Workshop	Napa	Hands-on calculations	Water, energy & GHGs	25
4/24/13	Webinar	Statewide	Metrics demo		4
5/14/13	Workshop	Riverside	Metrics demo	Water, energy & GHGs	20
5/15/13	Workshop	Riverside	Metrics demo	Water, energy & GHGs	14
6/11/13	Workshop	Napa	Hands-on calculations	Energy & GHGs	20
6/12/13	Workshop	S Joaquin	Hands-on calculations	Energy & GHGs	6
6/19/13	Webinar	Statewide	Hands-on calculations	Energy & GHGs	21
7/18/13	Workshop	SL Obispo	Hands-on calculations	Water, energy & GHGs	16
7/23/13	Workshop	Sonoma	Hands-on calculations	Water, energy & GHGs	15
7/25/13	Workshop	S Cruz	Metrics demo	Water, energy & GHGs	44
7/31/13	Webinar	Statewide	Metrics demo		5
8/8/13	Workshop	Sonoma	Metrics demo	Water, energy & GHGs	80

Table 4 details the statistics associated with grower and vintner submission of information on the metrics site. A total of 75 organizations with vineyards and 46 organizations with wineries established at least user profiles to initiate the metrics capture process. Of these organizations, 40% with vineyards and 57% with wineries calculated and submitted annual results for one or more metrics. Depending on the metric, this resulted in sample sizes (n) ranging from 33 to 91, which included submissions for more than one year for some vineyards and wineries.

Table 4. Metrics participation statistics (all years)

Vineyards		Wineries	
Total organizations	75	Total organizations	46
Organizations submitting metrics results	30	Organizations submitting metrics results	26
Sample size (n) – energy use	33	Sample size (n) – energy use	53
Sample size (n) – GHG emissions	59	Sample size (n) – GHG emissions	54
Sample size (n) – water use	91	Sample size (n) – water use	56
Sample size (n) – nitrogen use	77		

Metrics results were analyzed over the course of the project to mark progress, evaluate variation (including spatial and temporal), and identify and correct outliers. Despite the significant education and outreach effort, the use of the online platform for submitting and storing metrics results has been lower than anticipated. Likely reasons for the low use rates include the lack of established vineyard and winery business record-keeping systems for capturing the refined vineyard and winery inputs required for calculations (e.g., energy and water use), and perceptions of insufficient financial benefits to counter the costs of gathering and organizing input data. In conclusion, current sample sizes are too limited and data too variable to report representative statewide or regional averages with acceptable precision. Data will continued to be analyzed and averages considered for reporting after additional data collection in the future.

Objective 5 – Establish statewide metrics improvement targets and timetables.

As aforementioned, submitted metrics results were too limited and variable to report reliable statewide metrics baselines. Thus, collective improvement targets and associated timetables for improvements could not be completed before project completion. Nevertheless, CSWA is committed to the long-term success of SWP and metrics, and will continue to promote use of the online platform for assessing and tracking metrics and practices. Additional effort with expert partners to further characterize and convey the economic, environmental, and social value associated with assessments of metrics and practices is planned and should increase future use of the metrics site.

Objective 6 – Identify, develop, and convey tools, resources, and key practices to improve metrics performance.

Significant achievements were made against this objective despite the original plan to do most of the work after establishing reliable statewide baselines and improvement targets. Achievements include the development of text and links to key practices and resources within the integrated platform for characterizing the rationale for tracking metrics and how to take action to improve performance (Figure 10). The take-action elements reinforce the "measure to manage" mentality about the importance of connecting performance to on-the-ground practices for continual progress. The criteria and associated practices from the Workbook presumed to have the greatest impacts per metric as well as key NRCS and other educational resources were selected and linked.

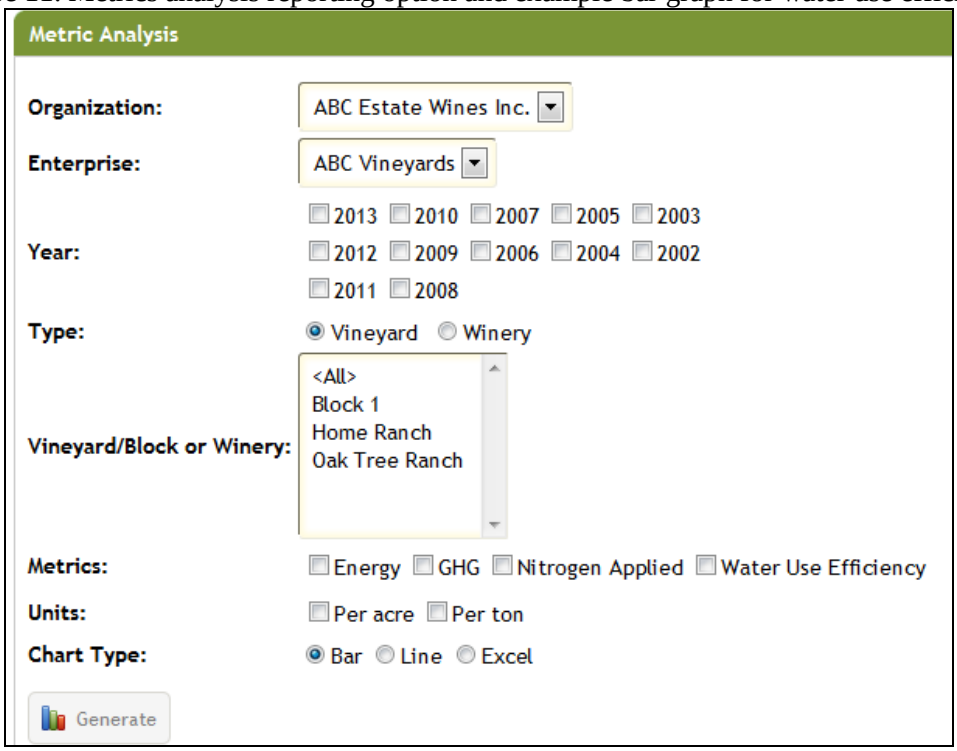
Another important tool developed to foster improved metrics performance is the reporting option to track internal business performance over time and among an organization's vineyards or wineries (Figure 11). Winegrowers can use this tool to relate trends in metrics performance to changes in practices or to uncontrolled variables such as weather fluctuations, resource constraints, or other factors.

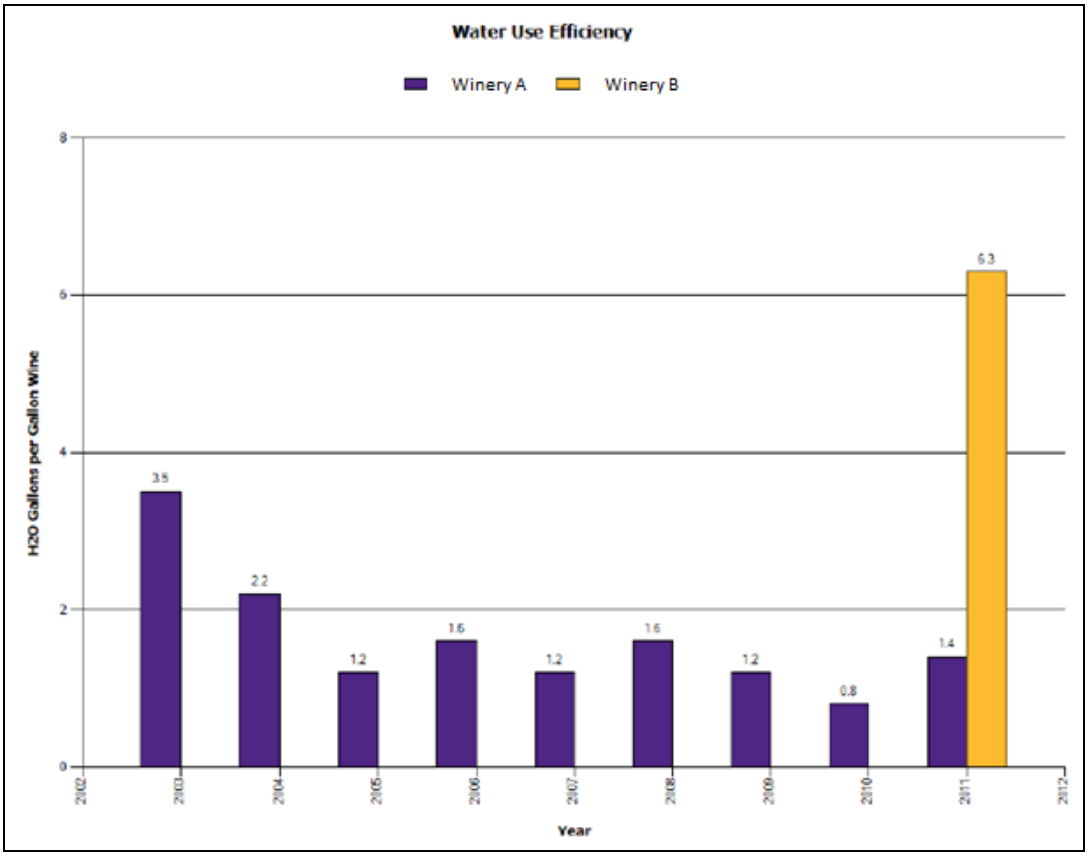
Other tools developed for advocating the use of metrics and improving performance include sections in the third edition Workbook that describe the metrics and input requirements, display associated metric icons, and detail means to access and use the online features. Video and written case studies about environmental performance metrics and practitioner applications also were produced and are posted on the CSWA website (www.sustainablewinegrowing.org/CSWA-video.php#22 and www.sustainablewinegrowing.org/CSWA-video.php#23), and other case studies were conveyed in the Winter 2011 CSWA Highlights Newsletter (Appendix A).

Moreover, practices for conserving natural resources and improving metrics performance were advocated at 15 workshops and webinars for 323 growers and vintners (Table 3). Topics pertinent to water and

energy conservation and mitigation of GHG emissions were presented by peer growers and vintners and expert partners.

Figure 11. Metrics analysis reporting option and example bar graph for water use efficiency





Objective 7 – Evaluate and report project impact.

This objective was achieved via frequent reporting of project status and accomplishments to leadership for CSWA, Wine Institute, and the California Association of Winegrape Growers; aforementioned industry outreach; and biannual progress reporting to NRCS.

Objective 8 – Expand project impact by transfer of the implementation process and results to other specialty crops.

Achievement against this objective is described in the following section: Conclusion and the Transferability of Results.

Significant Project Results:

- Finalized initial set of metrics and calculations for California wine industry tracking to include water use efficiency (vineyards and wineries), energy use intensity (vineyards and wineries), GHG emissions intensity (vineyards and wineries), and nitrogen use efficiency (vineyards).
- Configured an integrated online platform (metrics and modified SWP sites) to accommodate metrics calculations, storage, and the printing of results.
- Evolved the energy and GHG calculator to include soil-related Scope 1 emissions by linking the metrics site to the California vineyard DNDC model developed via partnership with Applied GeoSolutions and UC Davis.
- Incorporated online text and graphics for characterizing the rationale for tracking metrics and improving performance.
- Installed online educational information (including 2 video case-studies) and links that relate metrics to key criteria and practices from the *Code of Sustainable Winegrowing Practices Self-Assessment Workbook* and to NRCS and other resources to drive improved performance.
- Integrated performance metrics sections and how-to information into the third edition Workbook.
- Conducted outreach about the project, metrics, and process for using the online platform to more than 6,000 growers and vintners via composition and dissemination of newsletters, press releases, handouts, the Web, etc., and via outreach at numerous winegrower and other events.
- Launched the integrated online platform in March 2012 and developed an associated User Guide and vineyard and winery spreadsheets for gathering and organizing metrics input requirements.
- Held 22 workshops and webinars, including 11 hands-on events, attended by 348 growers and vintners to demonstrate features of the online platform and inspire growers and vintners to calculate and submit metrics data.
- Secured metrics participation from 75 vineyard and 46 winery organizations and sample sizes for submitted metrics ranging from n = 33 to n = 91.
- Developed an online internal business reporting feature enabling vineyard and winery organizations to graph, compare, and improve their vineyard and winery metrics over time.
- Conveyed practices for conserving natural resources and improving metrics performance at 15 workshops and webinars attended by 323 growers and vintners.
- Learned about limitations in practitioner capacities to provide metrics data and their perceptions about the value obtained from tracking and managing performance.

Conclusion and the Transferability of Results:

Significant advancements in the development and implementation of a process and tools for calculating and tracking environmental performance metrics were achieved by this project. The development of the

integrated online platform to house metrics calculators; store, print, graph, and report results; and convey relevant educational information, on-the-ground practices, and links for improvement is a key accomplishment. Although the submission of metrics information was less than expected, numerous winegrowers have been exposed to the concept of environmental performance metrics and the rationale for calculating and tracking them in concert with practice-based assessments to execute the "measure to manage" approach for increased business, environmental, and social value. Importantly, CSWA and its partners are committed to the long-term success of SWP and metrics, and will continue to promote the benefits of using the online platform to support continual improvement.

The commitment and processes used by CSWA to integrate practice-based assessments (inputs) with performance metrics (outputs), collect data, and track performance via online software substantiates the application of SWP and its overarching cycle of continuous improvement for inducing change and as a transferable, voluntary self-improvement model for other agricultural sectors. SWP elements already have been implemented in similar programs for California almonds, California cut flowers, California pears, Oregon hazelnuts, and other specialty crops. As evidenced by this project, CSWA and the California winegrowing community continues to demonstrate leadership in sustainable agriculture by balancing the economics of producing exceptional grapes and wine with high standards for environmental quality and social responsibility.

In the space below, provide the following in accordance with the Environmental Quality Incentives Program (EQIP) and CIG grant agreement provisions:

a. A listing of EQIP-eligible producers involved in the project, identified by name and social security number or taxpayer identification number;

b. The dollar amount of any direct or indirect payment made to each individual producer or entity for any structural, vegetative, or management practices. Both biennial and cumulative payment amounts must be submitted.

c. A self-certification statement indicating that each individual or entity receiving a direct or indirect payment for any structural, vegetative, or management practice through this grant is in compliance with the adjusted gross income (AGI) and highly-erodible lands and wetlands conservation (HEL/WC) compliance provisions of the Farm Bill.

As a statewide project, with a target audience of thousands of winegrape growers, it is difficult to list or even estimate the number of EQIP-eligible producers that were involved in the project. Nevertheless, it is estimated that a majority of the 6,000 winegrowers receiving outreach materials and the 348 winegrowers participating in workshops and webinars are EQIP-eligible producers.

No direct or indirect payment from this grant has been made to individual producers or entities for any structural, vegetative, or management practices.

Project Funding Received and Expended – final reimbursement (SF-270) and financial report (SF-269) submitted November 21, 2013

Expenditures Summary To Date (across objectives)
NRCS CIG 69-3A75-9-146
amended 9-18-12 with no-cost extension through September 18, 2013

	Reimburse Interval 07/01/13 - 09/18/13				Cumulative through 09/18/13				*3-Yr Project Budget Forecast			
	NRCS CIG	SWP Cash Match	SWP In-Kind	Total	NRCS CIG	SWP Cash Match	SWP In-Kind	Total	NRCS CIG	SWP Cash Match	SWP In-Kind	Total
Personnel	11,085.84	916.86	5,486.20	17,488.90	41,307.80	33,659.39	442,506.80	517,473.99	41,902.39	45,531.50	45,531.50	132,965.39
Benefits	2,485.23	205.54		2,690.77	7,819.48	6,128.26		13,947.74	7,178.10	3,642.50	3,642.50	14,463.10
Travel	1,531.07	57.40		1,588.47	9,554.75	21,132.55		30,687.30	13,905.84	9,000.00	9,000.00	31,905.84
Equip												
Supplies		552.00		552.00		29,266.10		29,266.10	2,500.00	5,000.00	5,000.00	12,500.00
Contract	15,087.50	1,541.75		16,629.25	523,787.00	252,532.90		776,319.90	511,314.89	217,350.00	217,350.00	946,014.89
Construct												
Other	6,362.19			6,362.19	7,578.97			7,578.97	13,246.78	14,500.00	14,500.00	42,246.78
TOTAL	**36,551.83**	3,273.55	5,486.20	45,311.58	**590,048.00**	342,719.20	442,506.80	1,375,274.00	**590,048.00**	295,024.00	295,024.00	1,180,096.00

CIG Project Action Plan and Timeline (excludes no-cost extension)

Goal = Develop, implement & evaluate a process to integrate the benchmarking of measurable environmental outcomes (performance metrics) with education (tool, resources & workshops) to speed adoption of sustainable practices by CA winegrowers and other specialty crop producers

Objective	2009 Q4	2010 Q 1	2010 Q 2	2010 Q 3	2010 Q 4	2011 Q 1	2011 Q 2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3
Obj 1 – ID and/or develop 5+ sustainability metrics & calculations												
Obj 2 – Configure online system to store & report metrics data												
Obj 3 – Conduct outreach to practitioners re: metrics & procedures												
Obj 4 – Collect & analyze baseline metrics data												
Obj 5 – Establish statewide metrics improvement targets & timetables												
Obj 6 – Develop & convey tools & practices to drive improvement												
Obj 7 – Evaluate & report project impact												
Obj 8 – Transfer project processes & results to other specialty crops												

Appendix A – Performance Metrics Communications, Outreach, & Educational Materials

*Materials are ordered by date of release/publication and include total number of people reached in most cases

- Performance Metrics Highlight Newsletter
  - Winter 2011
  - 6,000 copies distributed to wine trade press and California winegrape growers and vintners

- Performance Metrics Information Webpage on CSWA site
  - Launched March 2012
  - Information page created on the CSWA website which has broad reach (e.g., more than 45,000 unique visitors to the website during the grant period).
  - http://www.sustainablewinegrowing.org/performance-metrics.php

- Performance Metrics Press Release
  - March 19, 2012
  - Sent to 1,100 wine trade and environmental writers and editors
  - http://www.sustainablewinegrowing.org/articletype/4/Press_Releases.html#80

- Performance Metrics News Briefs
  - April 3, 2012
  - Sent to 1,500 vintner members of Wine Institute

- Performance Metrics/DNDC User Guide
  - April 2013
  - Available on SWP website and distributed at workshops

- DNDC/Metrics Educational Video
  - June 2013
  - Video was produced and posted on the CSWA website which has broad reach (e.g., more than 45,000 unique visitors to the website during the grant period).
  - http://www.sustainablewinegrowing.org/CSWA-video.php#22

- DNDC/Metrics Handout
  - June 2013
  - Available on CSWA website and distributed at workshops
  - http://www.sustainablewinegrowing.org/docs/DNDC_Handout.pdf

- Performance Metrics Educational Video
  - July 2013
  - Video was produced and posted on the CSWA website which has broad reach (e.g., more than 45,000 unique visitors to the website during the grant period).
  - http://www.sustainablewinegrowing.org/CSWA-video.php#23

- DNDC/Metrics Press Release
  - July 19, 2013
  - Sent to 1,200 people
  - http://www.sustainablewinegrowing.org/articletype/4/Press_Releases.html#94

CALIFORNIA
SUSTAINABLE WINEGROWING
ALLIANCE

HIGHLIGHTS

WINTER 2011

CALIFORNIA SUSTAINABLE WINEGROWING ALLIANCE NEWS

Benefits of Performance Metrics

By tying measurable performance outcomes to practices, Performance Metrics help growers and vintners to:

- Prioritize vineyard or winery plans for greatest operational efficiency
- Sort real from perceived outcomes and manage resources more efficiently
- Meet increasing market demand for information about how products are made and their impacts
- Take advantage of future financial incentives such as cap and trade and alternative pricing associated with energy/water efficiency

Performance Metrics also help the overall California wine community:

- Convey accurate information about sustainability efforts in public policy and market realms
- Strengthen the credibility of the Sustainable Winegrowing Program model with regulators, policymakers, retailers and consumers
- Enhance its global leadership position in sustainable agriculture and production by remaining on the leading edge of sustainability

CSWA to Introduce Performance Metrics for Sustainable Winegrowing:

Data to Determine Industry Averages for Water, Energy and Nitrogen Use

"YOU CAN'T MANAGE what you don't measure" is the principle behind the California Sustainable Winegrowing Alliance's (CSWA) new initiative to integrate Performance Metrics into the Sustainable Winegrowing Program (SWP). Performance Metrics, the measurable outcomes of business practices, are already used by growers and vintners to measure economic success such as farming costs per acre/ton of grapes, and production cost per bottle/case of wine. With CSWA's metrics project, growers and vintners will be provided with tools to measure, manage and track their use of natural resources. It will also help quantify performance, optimize operations and cut costs to increase sustainable practices.

CSWA's initial set of metrics includes use of water and energy in vineyards and wineries, greenhouse gas emissions in vineyards and wineries, and nitrogen use in vineyards. CSWA is developing an online Performance Metrics Sustainability Portal to help growers and vintners confidentially calculate, track and store their metrics data and access associated educational information. Participants will be able to compare their natural resource use from year to year and relate measurable outcomes to changed practices. The new portal will be part of CSWA's existing free online system.

Ultimately, CSWA will use compiled data to determine industry averages for water, energy and nitrogen use, with additional metrics to come.

Pilot workshops for calculating metrics online will be available in Spring of 2012. For more information, go to www.sustainablewinegrowing.org.

PHOTO BY RICK BOLEN

Performance metrics will help set industry averages for water, energy and nitrogen use.

"Sustainable winegrowing is an imbedded philosophy that we live by each and every day to ensure the continued growth of the California wine industry long into the future."

CHRIS SAVAGE, E. & J. GALLO WINERY AND CSWA CHAIRMAN

CERTIFIED CALIFORNIA SUSTAINABLE WINEGROWING

Energy Efficiency at Vineyard 29:

Gravity Flow and Natural Gas Use Are Among Innovations

WHEN VINEYARD 29 proprietors Chuck and Anne McMinn designed their Napa Valley winery, they had two goals in mind: to minimize the environmental impact of wine production, and install systems that would ensure the highest quality of wine. No detail was too small, and today Vineyard 29 operates with maximum energy efficiency.

Partially tucked into a carved out hillside, the winery's caves, cellars, offices and hospitality spaces take advantage of natural lighting, ventilation and cooling, thus minimizing the use of energy-intensive heating, ventilation and air conditioning (HVAC) equipment.

When required, HVAC and lighting systems are controlled by motion sensors that detect and respond to occupancy levels.

The barrel storage area is finished with tan-colored stucco which helps reflect artificial light and reduces by half the amount of lighting fixtures needed.

A gravity-feed system reduces the use of pumps and motors for conveying wine between tanks and barrels. Avoiding pumps also improves quality, as Chuck McMinn explains, "We can start the fermentation process with whole berries…which forces the yeast to work through the skins…extracting more colors and flavors."

An innovative cogeneration system creates electricity from natural gas and uses the by-product heat for heating and cooling purposes. This efficient use of fuel (80% vs. 30% efficiency of utility or "grid" power) considerably reduces greenhouse gas emissions and results in total energy cost savings of $24,000-$39,000 a year.

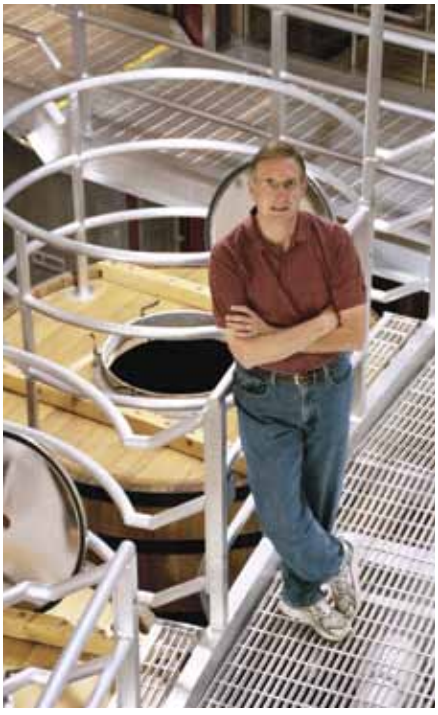


PHOTO BY SCOTT SUMMERS

Chuck McMinn stands above the winery's gravity flow tank system.

Reduce your Energy Use

Lighting:

- Install T-5 or T-8 fluorescent fixtures with lighting controls such as time clocks or motion detectors
- Clean lighting fixtures once a year

Buildings and Tanks:

- Insulate jacketed and cold stabilization wine tanks
- Install strip curtains on conditioned buildings with high traffic
- Reduce heat gain on tanks with solar screens or building insulation
- Insulate refrigerant lines
- Use night air cooling

Refrigeration:

- Replace air cooled condensers with evaporative condensers
- Install premium efficiency motors
- Variable speed drives on pumps and centrifugal fans
- Insulate glycol lines
- Shift electric use into less expensive off-peak times

Ponds

- Install premium efficiency motors
- 2 speed motors
- Time-of-use rate

Boilers

- High efficiency boilers
- Insulate hot water and steam lines
- Automatic pump shutoff on low/no demand

For more energy efficient tips, contact info@sustainablewinegrowing.org.

THE CALIFORNIA SUSTAINABLE WINEGROWING ALLIANCE (CSWA) program has broad industry participation with 1,700 wineries and vineyards, representing 70% of California's wine acreage and 65% of the state's wine shipments, which have evaluated their operations with CSWA's Code workbook.

In 2010, CSWA added voluntary Certified California Sustainable Winegrowing, which requires an annual assessment, meeting 58 prerequisites and doing a third-party audit. Forty wineries and more than 116 vineyards are certified with more applications in process. See: **www.sustainablewinegrowing.org.**

Water Conservation Tips

Simi's water conservation efforts include staff education with water use bulletins posted weekly (written with layman's terms, such as 20,000 gallons is the equivalent of 667 bathtubs of water). Below are some other water conservation tips from CSWA's Sustainable Winegrowing workbook:

- Install meters on wells; monitor and record water use regularly
- Use pond process water for vineyard and/or landscaping irrigation
- Cover (or move inside) crush and press operations to eliminate "baking" of waste material on equipment
- Consider installing an ozone system for winery equipment cleaning and sanitation
- Monitor water used to wash and soak barrels; set goals to reduce water use
- Monitor water use in cellar; consider alternative cleaning technologies
- Practice deficit irrigation in the vineyard
- Use drought tolerant plants in landscaping

Simi's water treatment plant will have paid for itself in nearly four years.

Conserving Water at Simi Winery:

Water Use Drops 42% Since 2007

USE OF A PERFORMANCE metrics system at Simi Winery in Healdsburg has resulted in dramatic savings in conserving water as well as environmental and economic benefits. "We've been tracking key performance indicators for water since 2007," says John Pritchard, Simi's Director of Operations. "Since then, our liters-of-water-used per liter-of-wine-produced has dropped from 5.2 to 3.0."

In addition to installing water-saving barrel washing systems, flow meters, spray nozzles at water stations and switching to chlorine dioxide as an alternative cleaning technology, Simi built a water treatment plant with an anaerobic digester that reduces its wastewater costs and the load on Healdsburg's water treatment system. "We've been able to save nearly $600,000 by treating our own wastewater. By the end of this fiscal year, the bio-digester, installed in 2008, will have paid for itself."

notes that the year Simi became a Sonoma County Green Business, the winery reduced its water use by 16.4% though it crushed 13.2% more tonnage. "We've attained our goal to cut our water use by 5% every year since 2008."

With a corporate social responsibility program since its 1945 founding, Constellation Brands – Simi's parent – has always looked for ways to improve the environment and minimize the impact of its winery sites.

"We take weekly water readings and compare them to a norm, investigating abnormal readings or discrepancies," says Pritchard, who

"We're growing greater populations of smaller vines with less, but higher quality fruit per vine."

JOHN CROSSLAND

Less is More for Nitrogen Use in Vineyards

John Crossland Finds Economic, Environmental and Quality Benefits

"IF YOU DON'T NEED TO APPLY IT, you don't have to buy it," says John Crossland, President of Vineyard Professional Services, discussing the use of applied nitrogen and other macronutrients in vineyards. Crossland, former Board Chairman and Director of the California Association of Winegrape Growers, has seen a marked decrease in nitrogen use in his forty years of grapegrowing and a corresponding increase in fruit quality. His company farms over 2,000 acres in Paso Robles.

"What we used to think was necessary actually generated excess vegetative growth and negatively affected fruit quality," says Crossland. "Today we're growing greater populations of smaller vines with less, but higher quality fruit per vine."

In addition to compost and legume-based cover crops to naturally add nitrogen to the soil and prevent erosion and runoff, Crossland estimates that he applies twenty pounds of organic and traditional commercial nitrogen per acre per year to his Paso Robles vineyards. "We do an annual plant tissue analysis and a thorough soil analysis before planting to establish a baseline for nitrogen and other nutrients, and continue to analyze every few years and make amendments as necessary," he says.

Curbing nitrogen use benefits the environment and the bottom line, which both carry equal weight with Crossland. "Our nutrient program averages about $100 per acre per year – maybe double that when we use compost," he says. "I can live with that."

Using less nitrogen can be accomplished without sacrificing yield and quality by improving soil health with cover crops and compost and by tailoring rates and timing of applications.

16 Reasons to Avoid Excess Nitrogen

1. Higher fertilizer cost
2. Potential groundwater contamination
3. Increased powdery mildew
4. Increased bunch rot
5. Increased Phomopsis (fungi)
6. More required canopy management/leaf removal
7. Growth interference with harvesting
8. Delayed maturation
9. Potential ethyl carbamate problems in wine
10. Lower phenolics in juice
11. Lower anthocyanins (pigments) in juice
12. Higher malate in juice
13. Higher pH in juice
14. Higher pruning costs
15. More grape leafhopper problems
16. Inadequate wood dormancy in late fall

Reprinted from CSWA's Code Workbook sourcing info from Pete Christensen, UC Viticulture Extension, Kearny Ag Center, Parlier.

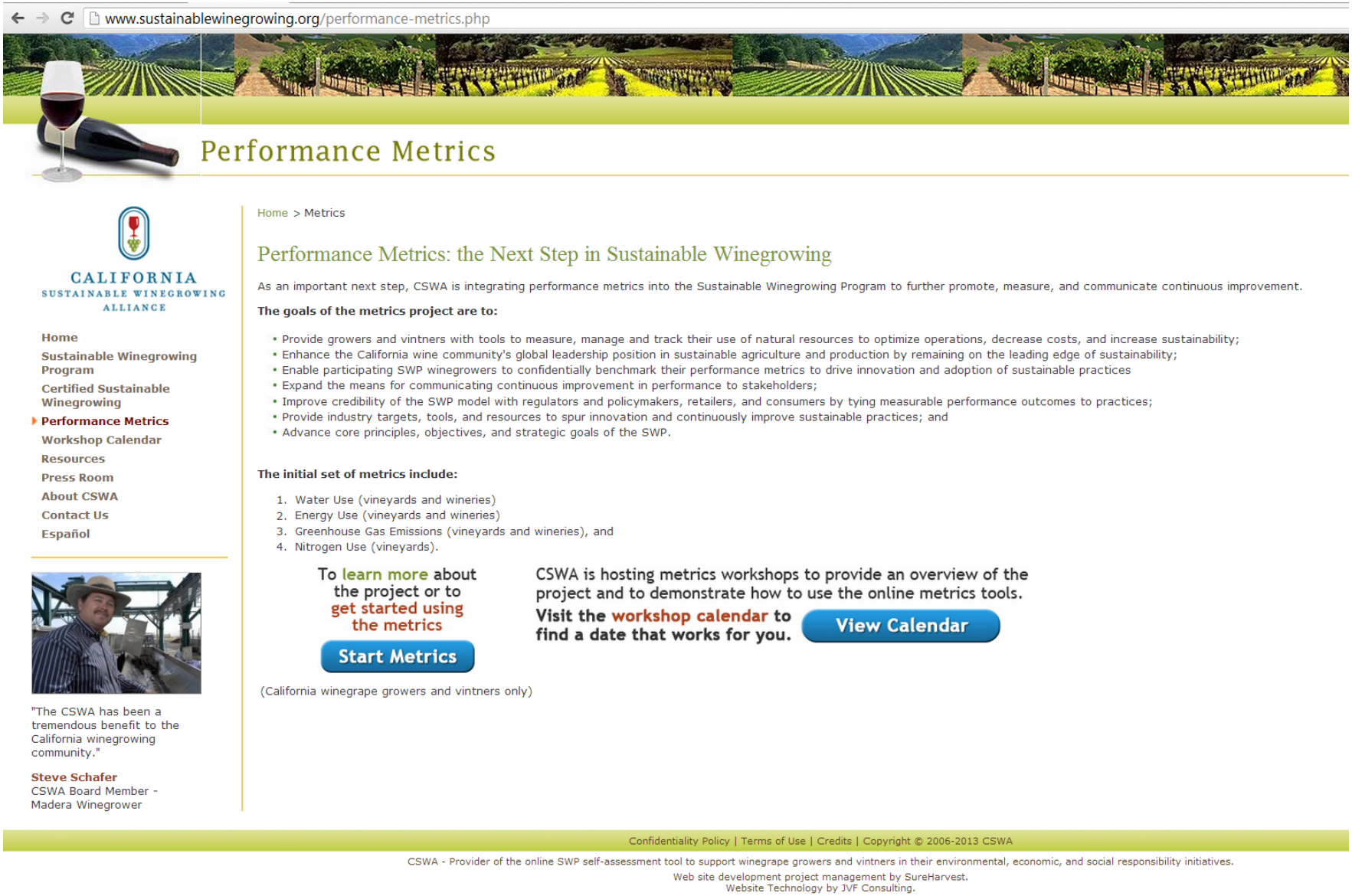
CSWA is a 501(c)3 nonprofit organization established in 2003 by Wine Institute and the California Association of Winegrape Growers. For information, contact 415/356-7525 or communications@wineinstitute.org.

WINE INSTITUTE

CALIFORNIA ASSOCIATION of WINEGRAPE GROWERS

Screen shot of Performance Metrics page on CSWA website.

Information page created on the the CSWA website which has broad reach (e.g., more than 45,000 unique visitors to the website during the grant period).



CALIFORNIA
SUSTAINABLE WINEGROWING
ALLIANCE

Contact: Allison Jordan, 415/356-7535
ajordan@wineinstitute.org or
Gladys Horiuchi, 415/356-7525
communications@wineinstitute.org

March 19, 2012

CSWA Introduces Performance Metrics to Help Growers and Vintners Measure Water and Energy Use

SAN FRANCISCO – The California Sustainable Winegrowing Alliance (CSWA) introduced a new online Performance Metrics tool to complement its Sustainable Winegrowing Program. Performance Metrics, the measurable outcomes of business practices, are already used by growers and vintners to gauge their economic success, such as farming costs per acre/ton of grapes or production cost per bottle/case of wine. This project will provide tools that enable growers and vintners to calculate, manage and track improvement of performance with a broader set of sustainability metrics. It will also help identify areas to optimize operations and cut costs.

CSWA's initial set of metrics, to be piloted in 2012, includes water and energy use in vineyards and wineries, and greenhouse gas emissions related to energy use. These metrics were selected by CSWA's Sustainable Winegrowing Joint Committee, comprised of 50 growers and vintners from throughout the California wine industry, because they met specific criteria, such as economic and environmental impact, data availability, ease of use, and state of the science. With matching funds from a U.S. Department of Agriculture Conservation Innovation Grant, CSWA has developed an online Performance Metrics calculator. Growers and vintners can confidentially track and store their metrics data and access associated educational information in the secure online system. Participants can compare their metrics from year to year and, eventually, link measurable outcomes to changed practices. The new online tool is part of CSWA's existing free online system that also includes a sustainable winegrowing self-assessment.

Once enough data is compiled, CSWA will use the aggregated data to identify opportunities to assist industry operators through education and technical support to gain better performance through reduced use of water and energy, and achieve lower GHG emissions related to energy use. Additional metrics may be developed in the future with guidance from the Sustainable Winegrowing Joint Committee. Workshops for calculating metrics online are available starting in March 2012. For information on workshop dates, go tohttp://www.sustainablewinegrowing.org/workshopcalendar.php.

The use of performance metrics to enhance the effectiveness of sustainability initiatives in all industry sectors, including agriculture, is increasingly common. The online Performance Metrics

calculator will allow operators to measure and track the effect of specific sustainability practices, which is essential to developing a business case for sustainability.

"California wine is committed to a leadership role in sustainability. These important measurement tools enable farming operations and companies of all sizes to more effectively improve sustainability performance and to ‘manage what they measure,’" said Allison Jordan, executive director of CSWA. “For growers and vintners, relating and tracking both practices and measurable outcomes helps prioritize vineyard or winery plans for greatest impact and operational efficiency – reducing inputs, saving money and minimizing adverse environmental and human impacts."

Jordan explained that the data can help vintners and growers not only prioritize operational efficiencies, but also address increasing market requests for product information. The data could also potentially help vintners and growers take advantage of developing financial incentives. With the addition of metrics to sustainable practices information, the industry will have an opportunity to quantify and describe the benefits of the Sustainable Winegrowing Program. CSWA is a San Francisco-based 501(c)3 nonprofit organization incorporated in 2003 created by Wine Institute and the California Association of Winegrape Growers to promote and implement the sustainable winegrowing program. CSWA encourages adoption of vineyard and winery practices that are sensitive to the environment, responsive to the needs and interests of society-at-large, and economically feasible to implement and maintain. Visit:www.sustainablewinegrowing.org.

# # #

NEWS BRIEFS

Volume 19 Number 11,
April 3, 2012

New Quarterly Board Report Summary in this Issue

Beginning with this issue, News Briefs will provide after each Board of Directors meeting a quarterly summary of top issues and Wine Institute department reports. This special summary is at the end of this News Briefs.

SACRAMENTO LEGISLATIVE DAY & MARCH BOARD MEETING HIGHLIGHTS

New Members Elected

At its March Board Meeting in Sacramento this month, the Wine Institute Board of Directors elected 12 wineries and one associate member to the membership, bringing the total count to 1,021. The new members are:

August West, San Francisco (San Francisco County)
Briar Creek Cellars, Napa (Napa County)
Giracci Vineyards, Silverado (Orange County)
Niner Wine Estates, Paso Robles (San Luis Obispo County)
Pech Merle Winery, Cloverdale (Sonoma County)
Ramspur Winery, Napa (Napa County)
Rendez-vous Winery, Clarksburg (Yolo County)
Seebass Vineyards, Talmage (Mendocino County)
Trione Vineyards & Winery, Geyserville (Sonoma County)
Willow Springs Village, Rosamond (Kern County)
Zhang's Winery, Napa, (Napa County)
Zucca Mountain Vineyards, Vallecito (Calaveras County)

The new associate member is **Scott Laboratories, Inc.,** in Petaluma, CA, offering fermentation, filtration, packaging supplies, crush, process and bottling equipment.

AB 907 and AB 2184 Board Actions

The Wine Institute Board of Directors voted unanimously to take positions on two bills.

Wine Institute opposes **AB 907 (Ma)** because the existing California Processors Law, which covers all California growers, provides more than adequate administrative remedies and penalties to CDFA to address the small number of delinquent processors and protect growers. Current law subjects wineries to civil and criminal penalties and license revocation if wineries fail to pay growers on time and in full. The additional fines and penalties proposed by AB 907 are unnecessary and some of its provisions, such as allowing CDFA to compel wineries to bear the cost of CDFA investigations following grower allegations, are onerous. The existing law works well for the vast majority of winegrape growers given the extremely limited number of enforcement actions resulting from

the tens of thousands of transactions in the annual $2-plus billion California winegrape market.

AB 2184 (Hall) would permit an individual with an ownership interest in a distilled spirits company to autograph spirits bottles at promotional events. The Wine Institute Board vote was to pursue amendments permitting winery owners and their personnel to sign wine bottles.

Sacramento Legislative Reception and Meeting

The annual Sacramento Legislative Reception was held on March 12 and 170 guests attended, including 35 legislators and other state officials. The following morning, Board members heard from Governor Jerry Brown and Senate Republican Leader Bob Huff. State Treasurer Bill Lockyer addressed the group during the luncheon.

Governor Brown addresses Wine Institute's board. (L-R) Chris Fehrnstrom, Kathleen Heitz, David Kent. Bobby Koch.

Thirty-five legislators and other dignitaries attended the Legislative Reception at the Senator Hotel.

(L-R) Bert Silk, Assembly Members Wes Chesbro &. Paul Fong.

(L-R) Tim Schmelzer, Senator Alex Padilla, Mike Falasco.

Sustainable Winegrowing Resolution Introduced

California Assembly Member Wes Chesbro introduced Wine Institute's proposed sustainable winegrowing resolution ACR 118, proclaiming April 2012 as the month to celebrate sustainability in California's wine industry. The Assembly and Senate Select Wine Committees are hosting an informational hearing on sustainable practices on April 12, and coordinating participation in a CSWA sustainable winery tour in Napa Valley on April 13.

Wine Institute issued a March 26 press release about California wineries' statewide celebration in April with consumer events that provide education on sustainable winegrowing practices. From "green wine trails" and Earth Day wine and food festivals to special eco-tours in the vineyard, California's vintners and growers are offering a wide variety of consumer activities, which can be found at discovercaliforniawines.com/d2e. Members are invited to add winery events to the website.

CSWA Introduces Performance Metrics Online Tool

CSWA has released a new online tool to help California vintners and growers to measure, track and improve the efficiency of their natural resource use. The user-friendly tool allows participants to log into a secure website to track and store their use of water, energy and other resources. Upcoming workshops about Performance Metrics are as follows:

April 18:	SWP Performance Metrics Workshop (Lake County)
April 26:	SWP Performance Metrics Workshop (Webinar)
May 22:	SWP Performance Metrics Workshop (Webinar)

To register, go to www.sustainablewinegrowing.org or contact jwilson@wineinstitute.org.

2012 Discover California Wines China Tour, June 4-8, 2012

Wine Institute's International Dept. is currently accepting registrations for this year's China Tour, which includes activities in Shanghai, Wuhan and Beijing. For further information, contact Eric Pope at epope@wineinstitute.org or Diane Berardi, dberardi@wineinstitute.org.

Register for Facebook 101 Seminar/Webinar

Wine Institute members are invited to attend a free April 20 seminar at the San Francisco office. It will also be broadcast as a webinar for those unable to attend in person. This beginner-level workshop will cover the nuts and bolts of how to set up a Facebook page, explain Facebook's new "Timeline" format and have time for general Q & A. Taught by social media consultant Mia Malm, the webinar will run from 10:30 a.m. - Noon. To register to attend either the in-person seminar or remote webinar, contact communications@wineinstitute.org. An instructional handout will be available to all participants.

Labeling Imported Wines with Multistate Appellations

TTB is amending the wine labeling regulations to allow the labeling of imported wines with multistate appellations of origin. This amendment provides treatment for imported wines similar to that currently available to domestic wines bearing multistate appellations. It also provides consumers with additional information regarding the origin of these wines. This final rule is effective April 23, 2012. For further information, contact: Jennifer Berry, TTB, Regulations and Rulings Division; Phone: 202/453-1039 ext. 275, or email: WineRegs@ttb.gov.

2012 Electronic Wine Institute Media Guide Published

Wine Institute has published its electronic 2012 Wine Media Guide in both Excel and PDF formats. The guide provides contact information for nearly 800 wine media across the nation. The Excel version can be used to create email lists, print labels and for other correspondence. The PDF version lists trade and consumer media contacts by state and last name. The Wine Media Guide is an exclusive benefit for Wine Institute members. It is available at the Member's Only site by logging on here and visiting the Document Library. Members can also request the guide by contacting Aimee Graham at: agraham@wineinstitute.org.

Louis J. Foppiano Passes Away

Louis J. Foppiano, patriarch of Foppiano Vineyards, passed away March 23 in Santa Rosa, California. He was 101. A great pioneer of Sonoma County's wine industry, Foppiano was a founding member of the Wine Institute, where he remained a director for 45 years. He was also a founding member of the

Sonoma County Wine Growers Association in 1946 and was its first president. Born on November 25, 1910, Foppiano was dedicated to his family, his 169-acre vineyard in the Russian River Valley of Sonoma County, and to his passion for wine. Foppiano is survived by son, Louis M. Foppiano and daughter Susan Foppiano Valera. Contributions in his honor may be made to St. John the Baptist Catholic School, 208 Matheson St., Healdsburg 95448.

Wine Institute 2012 Calendar

April 18	SWP Performance Metrics Workshop, Lake County
April 20	Facebook 101 Seminar/Webinar. Register: communications@wineinstitute.org
April 24	SWP Online Self-Assessment & Certification Workshop (Webinar)
April 26	SWP Performance Metrics Workshop (Webinar)
May 1	Sustainable Winegrowing Tailgate (multiple topics), Visalia
May 2	Sustainable Winegrowing Tailgate (multiple topics), Madera
May 3	Sustainable Winegrowing Tailgate (multiple topics), Manteca
May 7-10	Wine Institute's 30th Annual Washington Week, Washington, D.C.
May 22	SWP Performance Metrics Workshop (Webinar)
May 23	SWP Energy Efficiency Workshop, Livermore
May 29-31	California Wines Pavilion, VINEXPO Asia Pacific Hong Kong
Week of June 4	Wine Institute China Tour of Shanghai, Beijing and more
June 11-12	Wine Institute Board of Directors and Annual Meeting of Members, The Ritz Carlton, Lake Tahoe
Sept. 11	Wine Institute Board of Directors Meeting, Wine Institute San Francisco offices
Dec. 2-4	Wine Institute Board of Directors Meeting, The Inn at Spanish Bay, Pebble Beach

To register for Sustainable Winegrowing Practices (SWP) workshops, go to www.sustainablewinegrowing.org/workshopcalendar.php or contact jwilson@wineinstitute.org.

SWP Performance Metrics Calculator User Guide

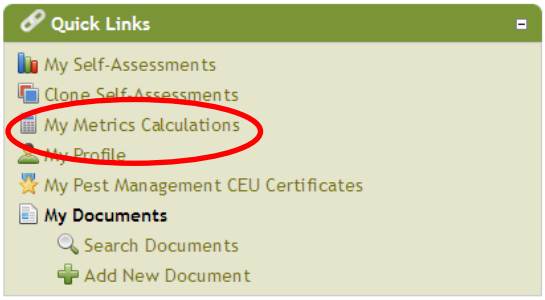
These instructions will help you use the SWP Metrics Calculator to track performance metrics for vineyards and/or wineries. Metrics can be calculated for use of energy (vineyards and wineries), water (vineyards and wineries), and nitrogen (vineyards), and for emissions of greenhouse gases (GHGs). Tracking metrics and practices used over years can help determine which practices have the most impact on specific metrics for your operation.

Getting Started

Log into the SWP application as you would when doing a self-assessment of vineyard/winery practices.

Once logged in, you will see the Quick Links section on the Home page.

- Click "My Metric Calculations."



Your organization's structure and individual vineyards and/or wineries are displayed.

- Click on the vineyard/winery that you want to calculate metrics for.
- Select the Assessment Year that you will be working on.
- Click on the Metrics tab to go to the Metrics Summary page.

The Metrics Summary page shows results of any calculations already done. This page is also the "gateway" to the Metrics Center which houses the Metrics Calculator.

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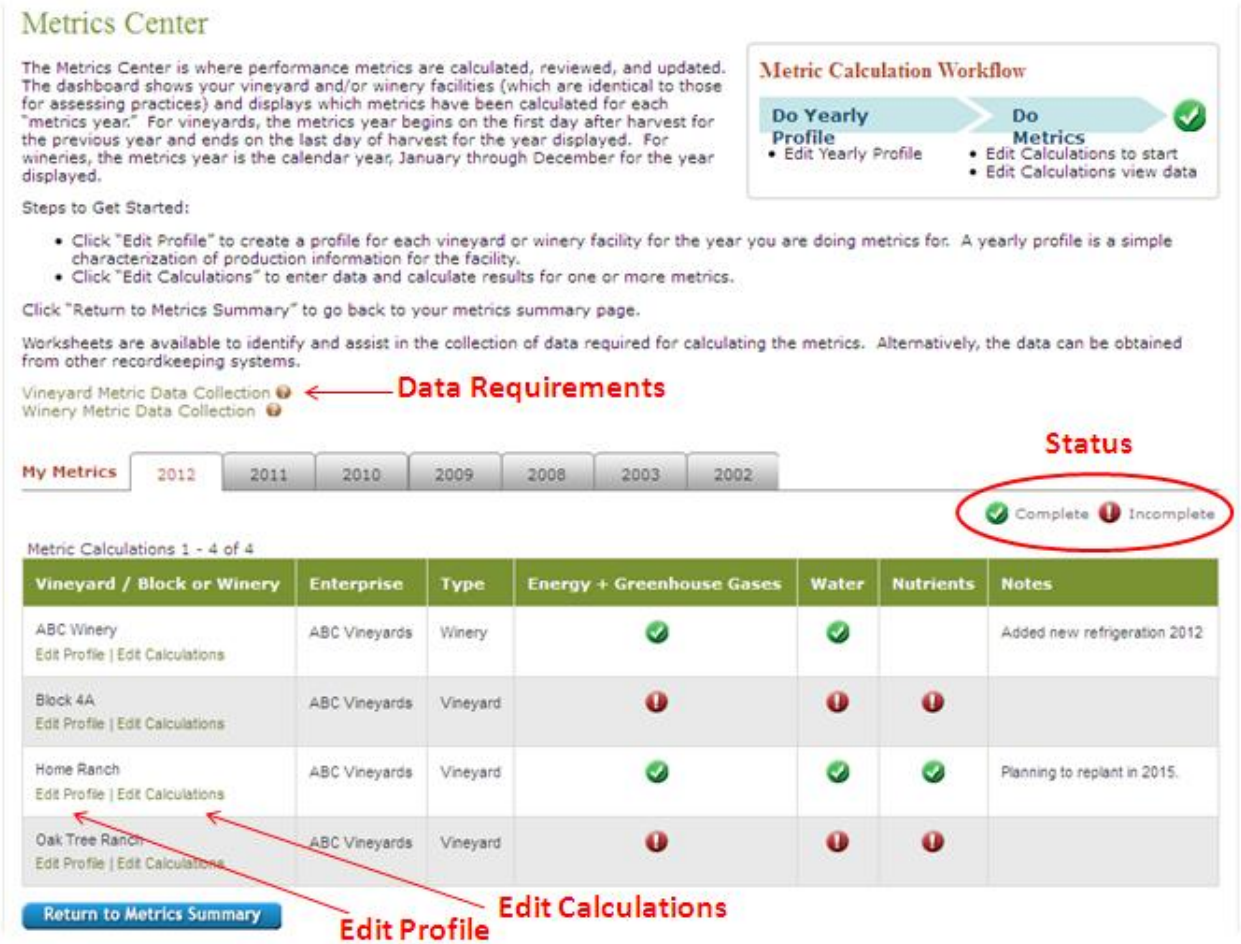
Using the Metrics Calculator

Click "Go to Metrics Center" to view the summary page showing the status (complete or incomplete) of metrics calculations for each vineyard/winery by year.



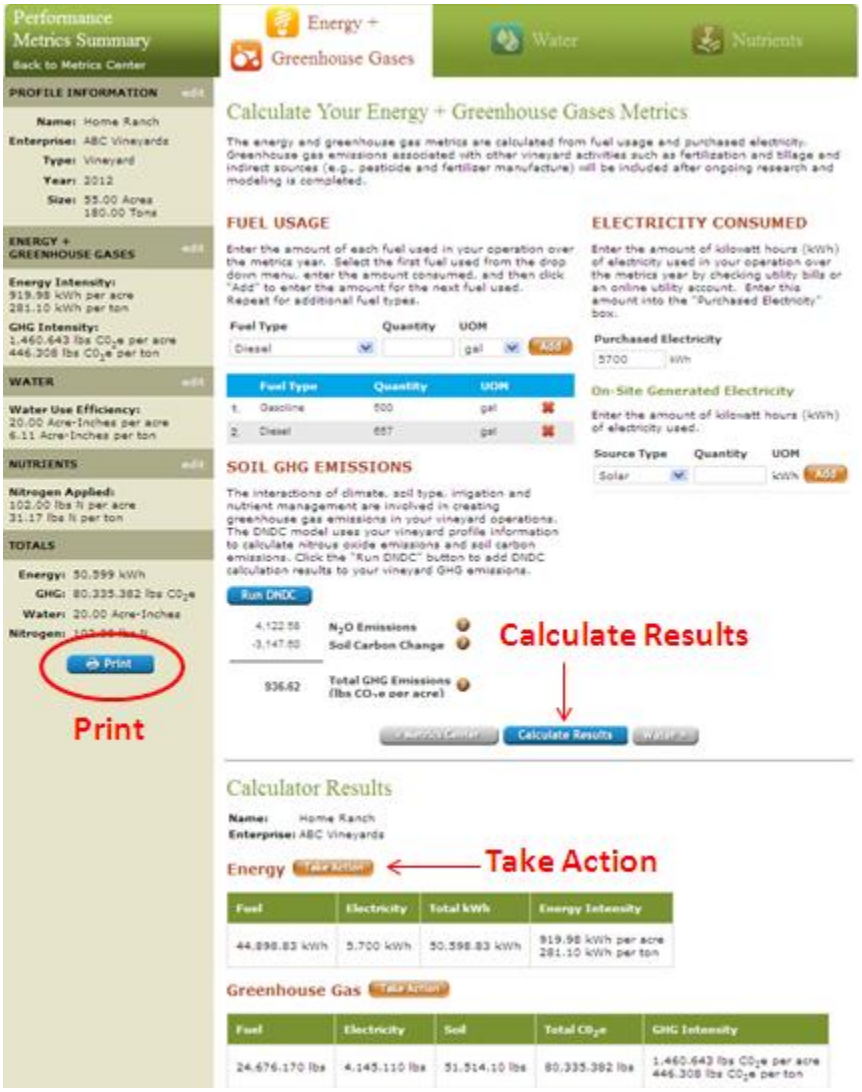
These are the steps for using the calculator:

- Click on Edit Profile for the vineyard/winery you are working on.

- Enter all relevant information on the Profile page.
- Click the Save button.

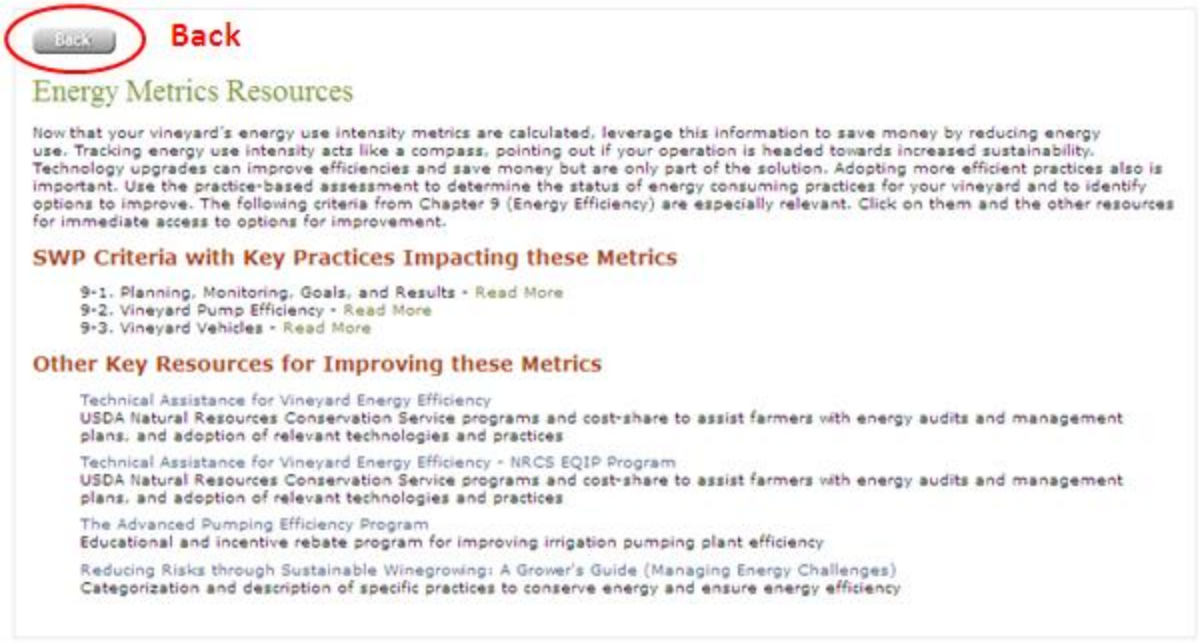
You will now be back on the Metrics Center page.

- Click on Edit Calculations to go to the Metrics Calculator.



The screen shot above shows the information associated with the Energy & Greenhouse Gases tab in the calculator. Tabs for other resource areas are displayed to the right. Each tab leads to a separate page where you follow instructions and enter required data to calculate metrics for that resource area.

- Once all required data is entered, click "Calculate Results" to calculate the metrics. The results are shown at the bottom of the page.
- Click the "Take Action" button associated with each set of results to access helpful information about key SWP practices and other resources impacting the metrics.



- Click the "Back" button to return to the calculator page for that resource area.

- Once metrics are calculated for a resource area, you can proceed by clicking the button in the middle of the page for the next resource area .

- Once completing the metrics of interest, you can print the results by clicking the "Print" button at the bottom of the left panel.

- To return to the Metrics Center, click the Metrics Center button in the middle of the page.

Once back at the Metrics Center, you will see any changes in the status of the metrics for each resource area – green checkmark means complete, red circle means not complete.

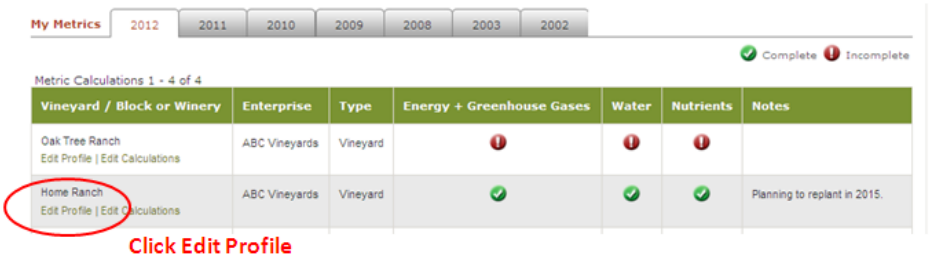
- To return to the Metrics Summary page in the self-assessment section of the online application, click the "Return to Metrics Summary" button.

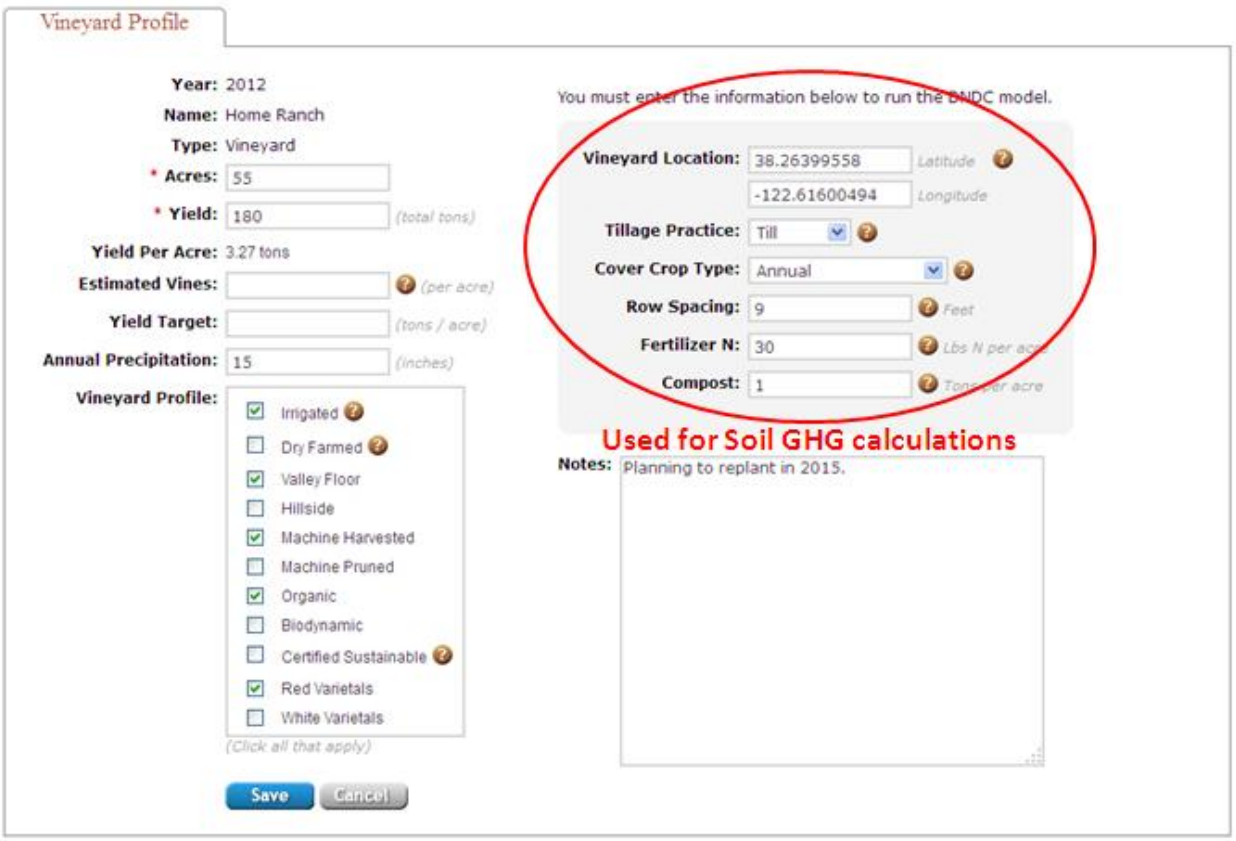
Instructions for SWP Metrics Calculator & DNDC GHG Emissions Calculations

The SWP Metrics Calculator has been integrated with the DNDC soil GHG model to calculate soil GHG emissions from vineyards.

The following instructions will help growers add required data to and run the model.

- From the Metrics Center, the grower selects "Edit Profile" and fills in the relevant Vineyard Profile information (including that circled below).

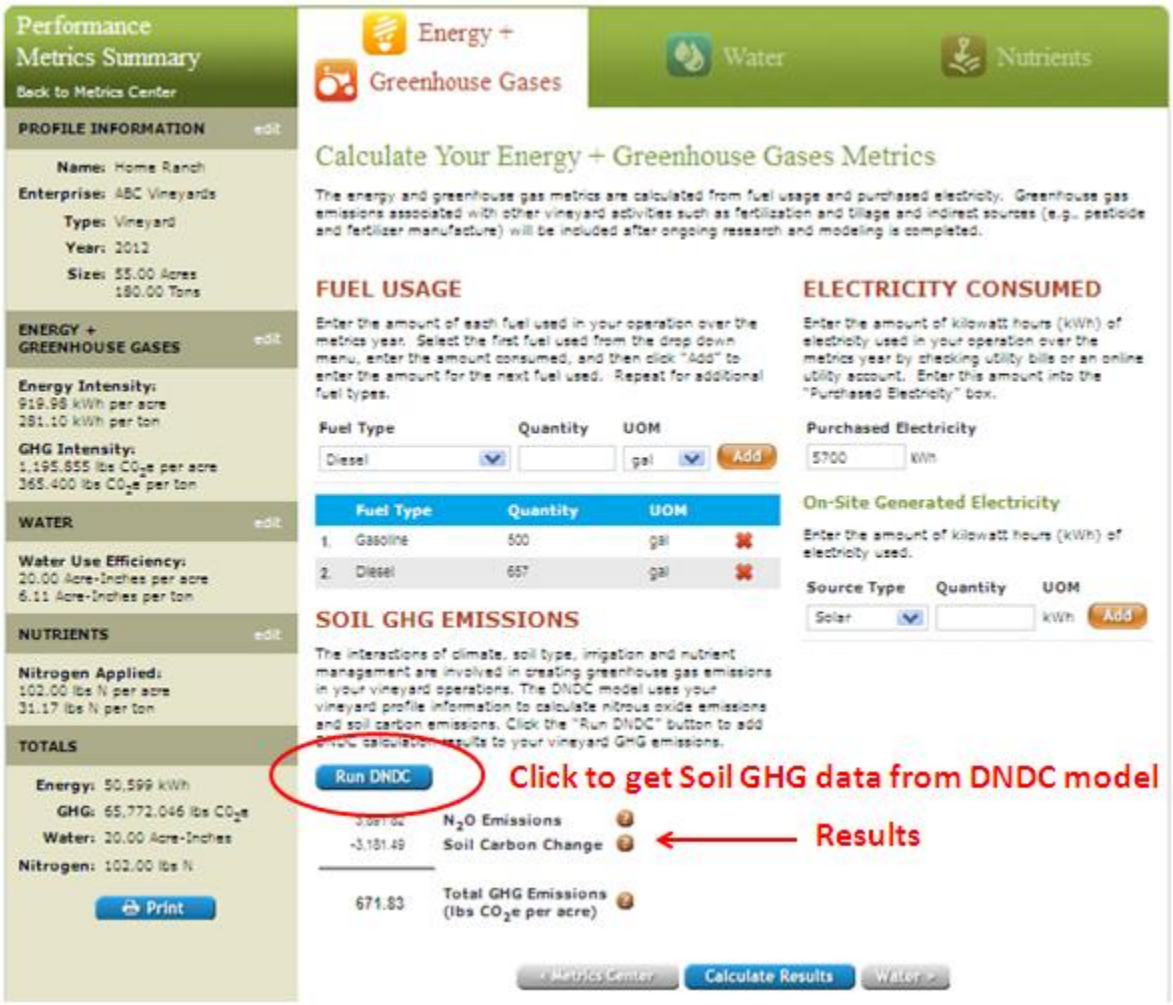




  - Vineyard Location is the Latitude & Longitude for a point in the vineyard (see instructions below for accessing a Web-based tool to find this information)
  - Tillage Practice
    - No-till or till (includes every other row)

- Cover Crop Type
  - Annual, perennial, or native
- Row Spacing
  - *Note: if your row spacing was more than 11 feet, enter 11*
- Fertilizer N
  - *Note: If you applied more than 30 lbs N per acre from commercial fertilizers, enter 30.*
- Compost
  - *Note: If you did not apply compost, enter 0 (zero)*

- Grower proceeds to metrics calculations
- On the Energy and Greenhouse Gases page, grower clicks the "Run DNDC" button in the Soil GHG Emissions section.



- DNDC results will be displayed in the Soil GHG Emissions section of the page.
  - ***Note:*** In some cases, an error message may pop up describing a problem in the profile information that was entered. Return to the Profile page and make the correction(s), then return to the Energy and Greenhouse Gases page to try the "Run DNDC" button again.

- After the amounts for fuel usage and electricity consumed have been entered and DNDC has been run, grower will click "Calculate Results" button.
- The GHG emissions results per category and in total will be displayed in the GHG section.

Greenhouse Gas Take Action

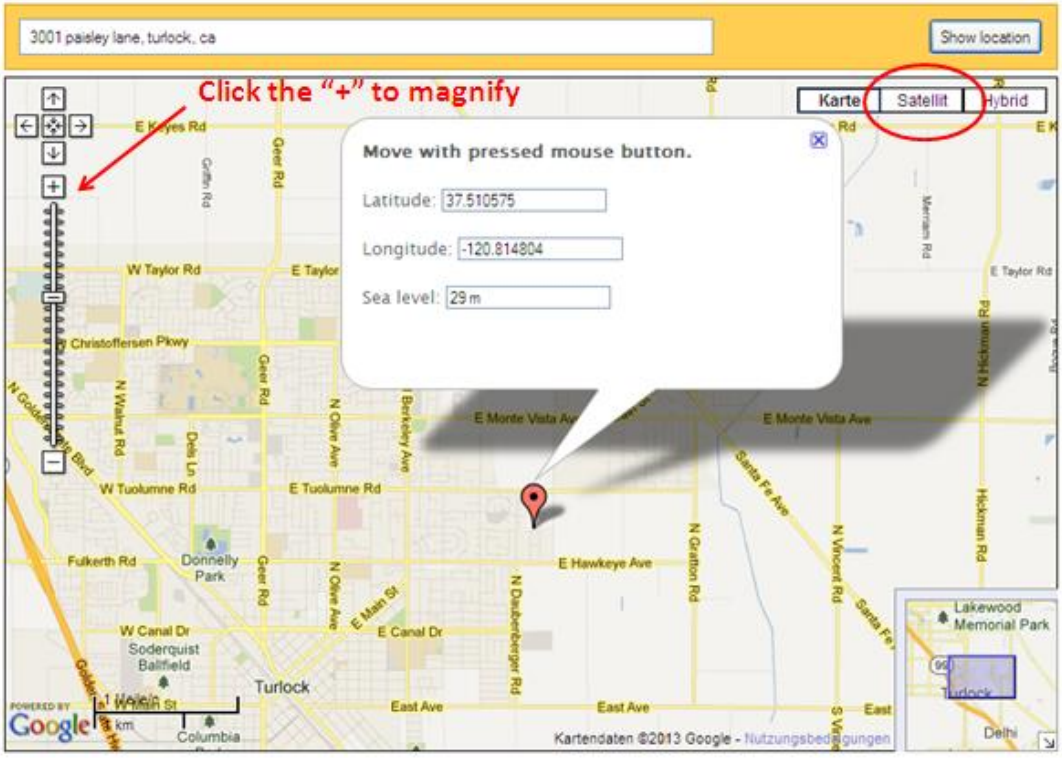
Fuel	Electricity	Soil	Total CO_2e	GHG Intensity
14,861.080 lbs	4,145.110 lbs	-4,785.039 lbs CO_2e per acre	14,221.150 lbs	258.566 lbs CO_2e per acre 79.006 lbs CO_2e per ton

- Grower can now continue to calculate metrics for other resource areas.

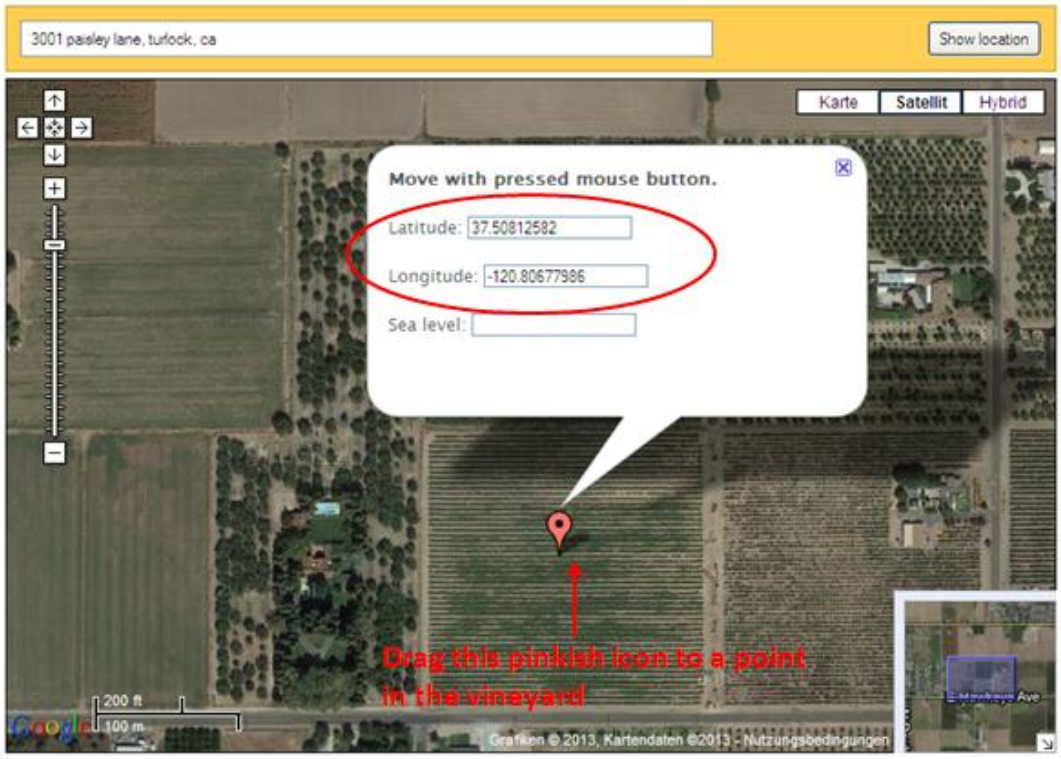
Finding a Latitude & Longitude for Your Vineyard

The DNDC model requires a latitude and longitude for a point in your vineyard. You may already have these coordinates from a vineyard consultant or other source. If not, the following instructions will help you obtain the information.

- Go to the web site www.mapcoordinates.net/en
- Type in an address near your vineyard in the orange bar in the middle of the page and then click the "Show location" button.



- Click the “Satellit” button in the upper right of the map. An aerial image of the area near your vineyard will be displayed. Click the “+” sign to magnify the image so you can find your vineyard.
- Use the mouse to drag the pinkish icon with the black dot to a point in the vineyard.



- Record the displayed Latitude and Longitude coordinates (or copy and paste) for entry into the Vineyard Profile page in the Metrics Calculator.

Benefiting the environment, the community and high quality grapes and wine

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CSWA would like to thank the U.S. Department of Agriculture and the California Department of Food and Agriculture for the Specialty Crop Block Grant that helped make this project possible, in addition to the many project partners who also contributed their time and expertise.

Project Partners:

American Carbon Registry

Applied GeoSolutions

California Association of Winegrape Growers

Environmental Defense Fund

SureHarvest

University of California, Davis

USDA Agricultural Research Service

Wine Institute

DNDC Greenhouse Gas Modeling for California Vineyards

What Is DNDC?

DNDC (DeNitrification-DeComposition) is a computer model that simulates carbon and nitrogen cycling among soil, air, and crops. Because it is a process-based model, DNDC simulates the interactions among local climate, local soils, and on-site management practices to simulate crop growth and yield, and the emissions and consumption of gases within the soil environment. Gases include ammonia (NH_3) and the greenhouse gases (GHGs) carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4). Calculations by most GHG models do not account for vineyard-specific interactions, and instead rely on constant emission factors or simple empirical relationships. Thus, process-based GHG models are presumed to provide more realistic simulations because they simulate the mechanisms that drive emissions.

Why is DNDC Needed for the California Wine Industry?

For more than a decade, the California wine industry has promoted sustainable practices through the California Sustainable Winegrowing Program (SWP; www.sustainablewinegrowing.org) and regional activities. Most efforts to date have involved growers and vintners assessing their use of management practices that have been determined to be more sustainable by peers and experts. In spring 2012, the California Sustainable Winegrowing Alliance (CSWA) expanded the SWP to include performance metrics for energy, water, and nitrogen use, and GHG emissions. Calculating and linking metrics with practices helps practitioners "measure to manage," to reduce input costs and risks (environmental and production), and potentially benefit from market and regulatory incentives.

Although the wine industry has identified GHG metrics as important, minimal research has been conducted to quantify soil-related GHG

California Vineyard Climate Change Projects

Vineyard Management Practices and Carbon Footprints Grower Handout

A short summary of the key management practices that influence carbon sequestration and GHG emissions in the vineyard.

www.sustainablewinegrowing.org/docs/GHGhandout.pdf

California Vineyard Greenhouse Gas Emissions: Assessment of the Available Literature and Determination of Research Needs

A summary report of a literature review used to determine what was known about California vineyard GHG production and sequestration potential. The report also provides a strategic plan to prioritize research to advance understanding of the influence of vineyard management practices on GHG emissions.

www.sustainablewinegrowing.org/docs/GHGreport.pdf

DNDC simulates the interactions among local climate, local soils, and on-site management practices to simulate crop growth and yield, and the emissions and consumption of gases within the soil environment.

emissions and carbon sequestration in California vineyards. Because of this, and prior to application of DNDC modeling, calculations of GHG metrics for California vineyards used unrefined emission factors for soil processes or only considered emissions from energy use. Nevertheless, to increase grower awareness and begin influencing on-the-ground actions, key practices expected to mitigate soil-related GHG emissions and enhance carbon sequestration were highlighted in a grower handout. DNDC enables the California wine industry to more accurately and completely quantify vineyard GHG emissions and carbon sequestration.

How Has DNDC Been Modified for California Vineyards and Linked to the SWP Online System?

Modification of the DNDC model involved calibrating it to account for the growth, development, and fate of above- and below-ground plant tissues (vine and cover crop) based on interactions among climate, soils, and management practices. After calibration, the model was validated by comparing field-collected data to modeled results for soil temperature and moisture, vine growth, and GHG emissions.

The full California vineyard DNDC model is a powerful tool for quantifying the effects of management practices on GHG emissions. Its application, however, requires extensive knowledge and data inputs. To increase the usability by growers while retaining sufficient accuracy for educational purposes, a simplified version has been linked to the SWP online system. This version limits the data inputs for practices to those having the greatest impacts on soil-related emissions and carbon sequestration (row spacing, type of tillage, use and type of cover crop, amount of compost, and amount of nitrogen applied as fertilizer). Results help growers understand relationships between key practices and emissions, and how to improve. The full DNDC model also has the potential to be used to simulate results for other practices or circumstances requiring the highest level of accuracy (e.g., for saleable carbon offsets).

How Does DNDC Function Within the SWP Online Framework?

The Metrics Calculator within the SWP online system is used to provide inputs to the simplified DNDC model that subsequently

returns estimates of N_2O emissions, change in soil carbon content (CO_2 emissions minus carbon sequestered), and the total of soil-related GHG emissions for the year simulated. Inputs needed are selected within the Metrics Calculator (location, tillage practices, cover cropping, row spacing, fertilizer and compost amounts, etc.) and run through the simplified model. The model integrates the selected management practices with historical climate information via the nearest CIMIS station and soils data via the NRCS Soil Survey for its calculations. DNDC results are then combined with Metrics Calculator results for GHG emissions from fuel use and purchased electricity to provide cumulative GHG metrics (CO_2 equivalents per acre and per ton of yield).

SWP participants can access the Metrics Calculator User Guide from the SWP online system homepage for more details about how to use the Calculator and its DNDC application.

What Are Potential Future Uses of the DNDC Model for Winegrapes?

The DNDC model offers one of the most promising, cost-effective and accurate ways to estimate GHG emissions in agricultural ecosystems, which is why its use has increased over the past two decades. The model has been calibrated for over 40 crops, including corn, rice, wheat, grapes, tomato, pasture, and almonds in locations from India to Belgium to Costa Rica to the United States. Application of the model is supporting the development of offset protocols for cap-and-trade markets and voluntary supply chain initiatives.

California's cap-and-trade system provides some agricultural producers with the opportunity to generate additional revenue for practices that are not yet widely adopted and that reduce overall GHG emissions through a voluntary carbon market. Winegrape growers may be able to participate in this market by aggregating carbon offsets. Since the DNDC model has been calibrated and validated for California winegrapes, an important step in the development of carbon offset protocols for winegrapes has been achieved.

California Vineyard Climate Change Projects

Sustainable Winegrowing Performance Metrics Calculator

A user-friendly online tool for California growers and vintners to measure and track their use of energy, water, nitrogen and GHG emissions. Knowing and understanding the relationship between management practices and measured outcomes is important for benchmarking and managing performance to optimize business operations, decrease costs, and conserve natural resources.

https://metrics.sustainablewinegrowing.org/

Use the New DNDC Online Tool to Calculate Your Vineyard GHG Emissions

DNDC Tool Inputs:

- Vineyard location
- Row spacing
- Tillage practices
- Use and type of cover crop
- Amount of compost
- Amount of nitrogen applied as fertilizer

https://metrics.sustainablewinegrowing.org/

DNDC stands for DeNitrification and DeComposition, two processes dominating losses of N and C from soil and GHG emissions into the atmosphere.

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Additionally, retailers, food producers, and agricultural trade groups are developing and implementing GHG measurement and reduction initiatives for the food and beverage supply chain. Initiatives include The Sustainability Consortium and the Stewardship Index for Specialty Crops. A key goal is to encourage growers, processors, and other businesses within the supply chain to measure the impacts of their practices on GHG emissions and natural resources.

Use of the SWP online Metrics Calculator and its integration with the DNDC model can help California winegrape growers participate in supply chain initiatives and – in the future – potentially benefit from cap-and-trade markets by calculating and tracking GHG emissions.

About the California Sustainable Winegrowing Alliance

The California Sustainable Winegrowing Alliance (CSWA) is a San Francisco-based 501(c)3 non-profit organization created in 2003 by Wine Institute and the California Association of Winegrape Growers to promote the adoption of sustainable winegrowing practices and enlist industry commitment through the implementation of the Sustainable Winegrowing Program (SWP). In addition to this DNDC handout, CSWA has a number of additional resources available on its website. To view CSWA educational videos, including videos on Performance Metrics and DNDC, visit http://www.sustainablewinegrowing.org/CSWA-video.php. For more information and a calendar of upcoming CSWA workshops, visit www.sustainablewinegrowing.org/workshopcalendar.php.

CSWA promotes sustainability through continuous improvement with the implementation of best practices, but also recognizes that not all practices are relevant or appropriate for every operation. CSWA strives to provide information and resources to help growers and vintners make the most sustainable decisions for their individual operations.

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July 19, 2013

CSWA Introduces Online Tool to Measure Vineyard Greenhouse Gas Emissions

SAN FRANCISCO – The California Sustainable Winegrowing Alliance (CSWA) has introduced an online tool for calculating greenhouse gas emissions and carbon sequestration in California vineyards. The tool, named the DeNitrification and DeComposition (DNDC) model for winegrapes, was developed to help winegrowers "measure to manage" to reduce input costs and emissions. The tool is part of CSWA's online Sustainable Winegrowing Self-Assessment and Performance Metrics system, the latter of which measures, manages and tracks energy, water and nitrogen use, and greenhouse gas emissions. The tool was developed with partial funding from a three-year California Department of Food and Agriculture Specialty Crop Block Grant.

"More than 1,400 researchers and stakeholders worldwide use the DNDC Model on over 40 agricultural crops to assess the effects of various management practices on greenhouse gas emissions," said Allison Jordan, CSWA executive director. "By incorporating the DNDC model into our program, growers can see more clearly how vineyard practices combine to reduce nitrogen applications, save money and minimize soil-related greenhouse gas emissions. Avoiding excess nitrogen benefits growers' bottom-line, contributes to wine quality and delivers better environmental outcomes."

Jordan explained that the online Performance Metrics system offers a simplified, user-friendly version of the DNDC tool that enables winegrowers to customize the variables that are the most significant drivers of soil-related greenhouse gas emissions in vineyards. These variables include practices such as row spacing, type of tillage, use and type of cover crop, amount of compost and amount of nitrogen applied as fertilizer. Results help growers understand relationships between key practices and emissions, and how to improve. For more DNDC tool information, click here.

CSWA worked with Applied GeoSolutions, UC Davis, SureHarvest, the USDA Agricultural Research Service and other project partners over several years to calibrate and validate the DNDC model for winegrapes, assess the influence of vineyard management practices on greenhouse gas emissions and create a user-friendly tool for use by California winegrowers. To begin using the DNDC tool within the Performance Metrics site, visit https://metrics.sustainablewinegrowing.org where California participants can log in with their CSWA Username and Password or request a new Username.

About the California Sustainable Winegrowing Alliance

The California Sustainable Winegrowing Alliance is a 501(c)(3) nonprofit organization incorporated in 2003 by Wine Institute and the California Association of Winegrape Growers. CSWA's mission is to ensure that the California wine community is recognized globally as the leader in sustainable winegrowing in the marketplace and public policy arena through the development and promotion of sustainable practices, tools for education and outreach, partnerships with key stakeholders and prioritizing research. In the last decade, 1,800 vineyard and winery organizations, representing more than 70 percent of California's winegrape acreage and case production, have participated in CSWA's Sustainable Winegrowing Program. See: www.sustainablewinegrowing.org.

# # #