IACM Annual Conference

November 7, 2018

Chris Savage, Sr. Director Global Environmental Affairs

California
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Flourishing Together…

Our Company. Our Planet.

Our Roots

From our humble beginnings, the hallmark of our company has been an unwavering commitment to quality and environmental protection. By taking the utmost care through each and every step of the grape growing and wine making process, we ensure that there is healthy soil and clean water to grow lush vineyards - to make the best wine today and in the future.

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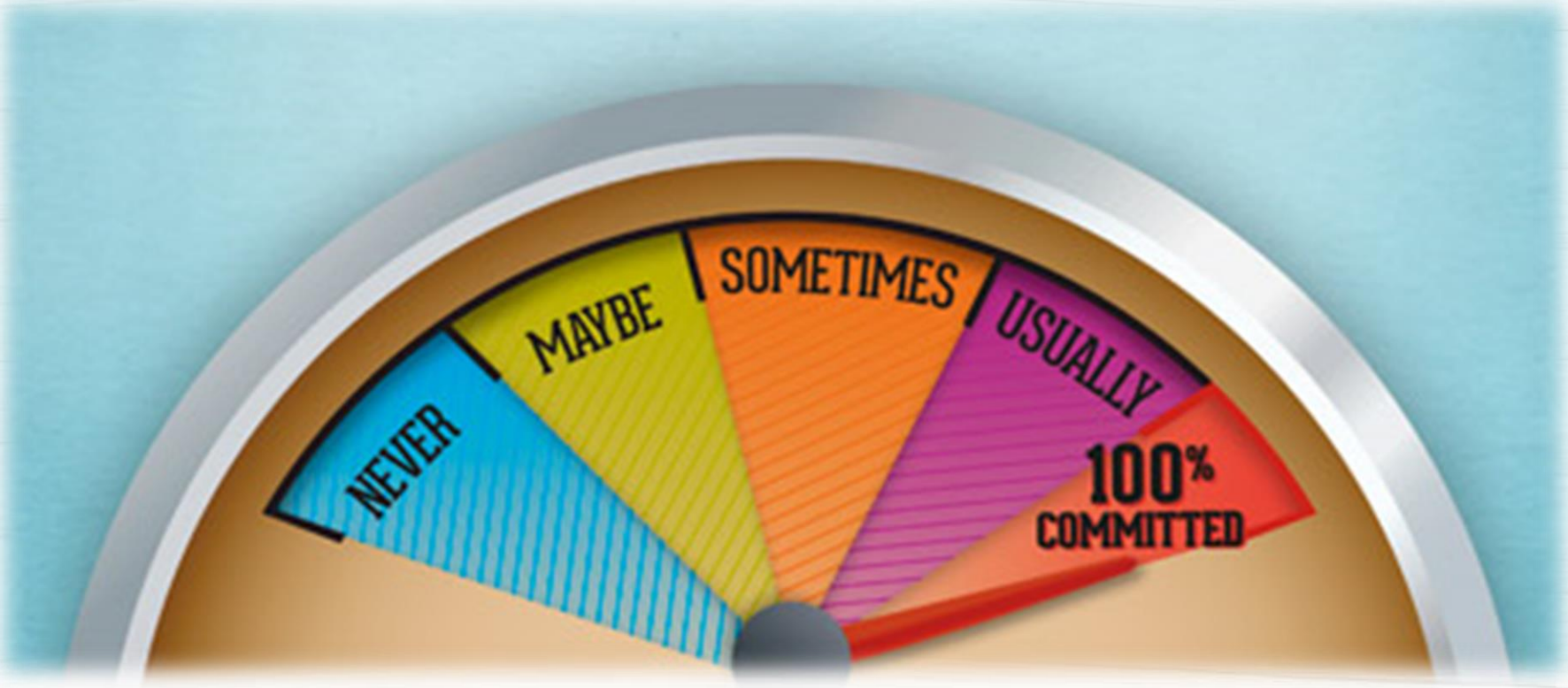
Has the Message Changed? No!



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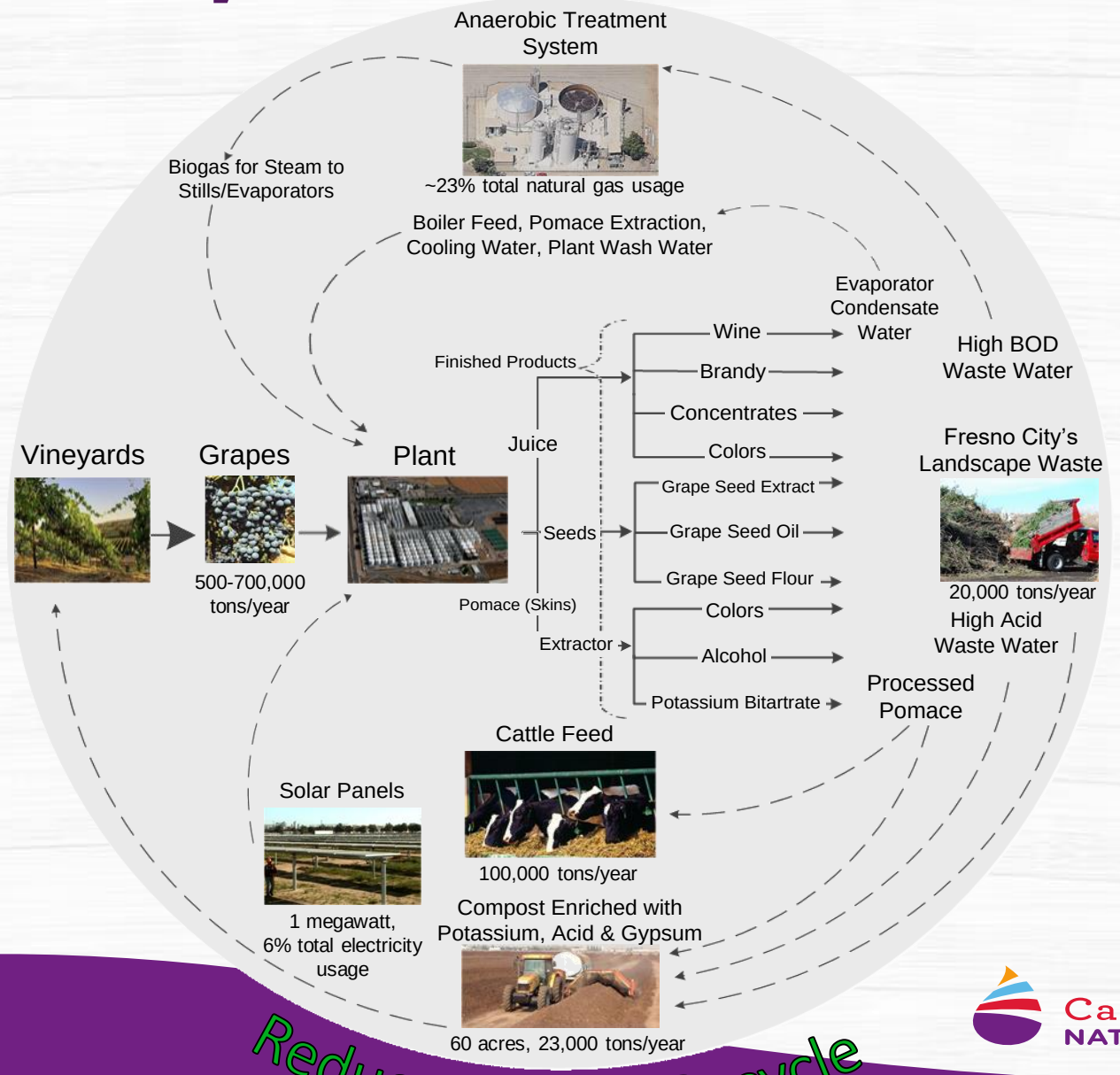
Sustainability at California Natural Color



Reduce, Reuse, Recycle

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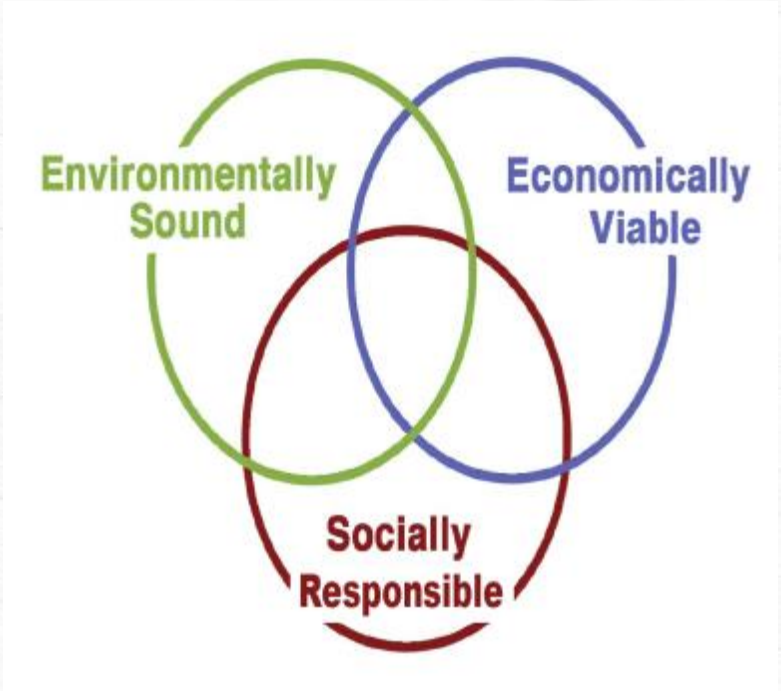
Social Sustainability

- Employees Are Our Greatest Asset
- Employee Work Life Balance Programs
- Community Outreach Programs



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Community Giving and Outreach

- Employee Matching Gift Program
- Corporate Charitable Giving
- Hosting Community Fundraising Events
- “Gallo Connections" Employee Portal

Our Commitment to the Industry Efforts

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Programs and Affiliations

CERTIFIED CALIFORNIA SUSTAINABLE VINEYARD & WINERY

FISH FRIENDLY FARMING

BRIT
Botanical Research Institute of Texas
Plant to planet.

FIVS

LLOYD'S REGISTER QUALITY ASSURANCE · ISO14001

CALIFORNIA ASSOCIATION of WINEGRAPE GROWERS

MCCV
MANUFACTURERS COUNCIL of the CENTRAL VALLEY

BAY AREA GREEN BUSINESS

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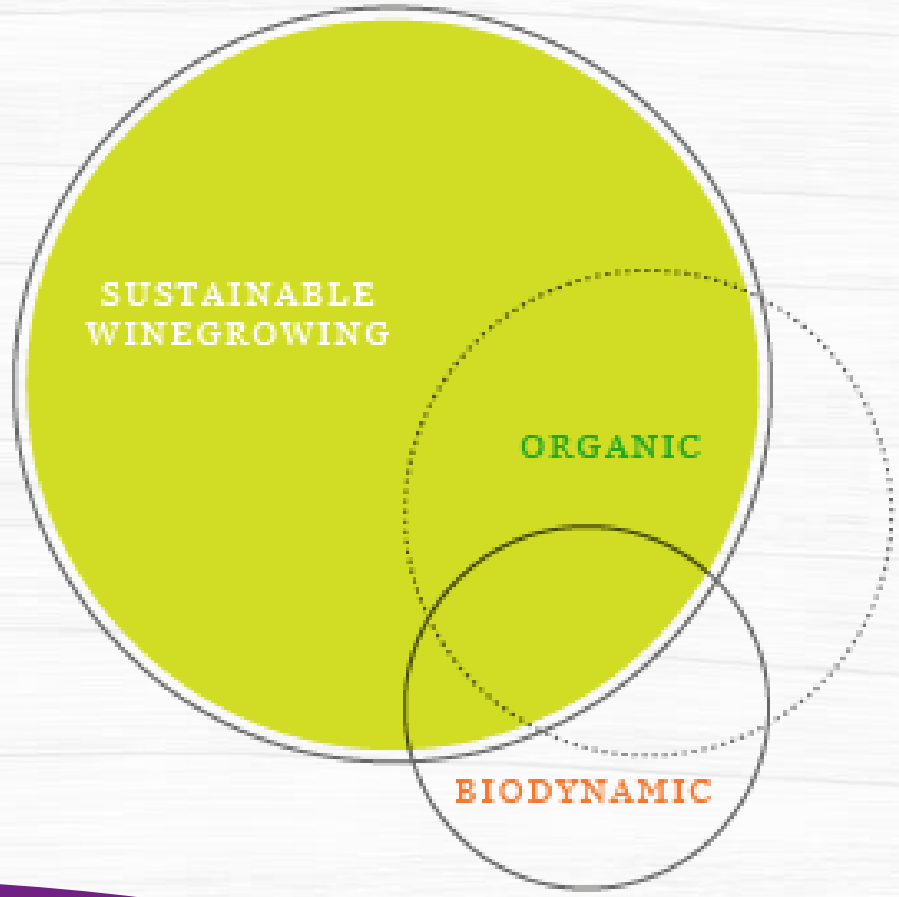
Sustainable, Organic, Biodynamic



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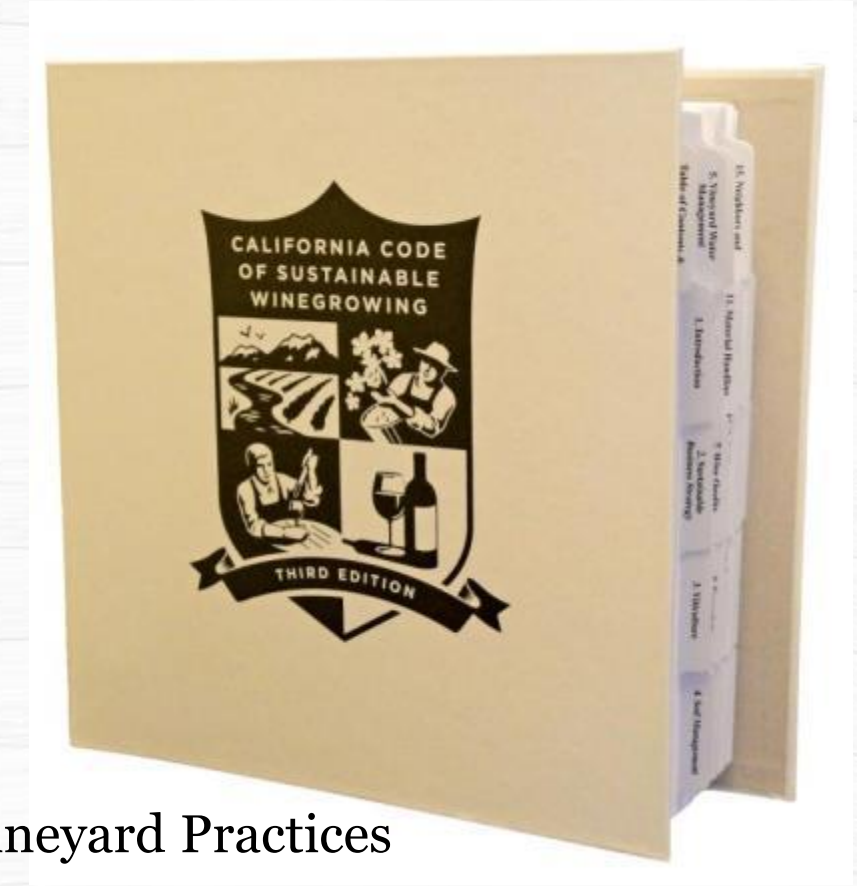
CA Code of Sustainable Winegrowing



- 138 Vineyard Practices
- 103 Winery Practices

- Sustainable Business Strategy
- Viticulture
- Soil Management
- Vineyard Water Management
- Pest Management
- Wine Quality
- Ecosystem Management
- Energy Efficiency
- Winery Water Conservation & Quality
- Material Handling
- Solid Waste Management
- Environmentally Preferable Purchasing
- Human Resources
- Neighbors and Community
- Air Quality

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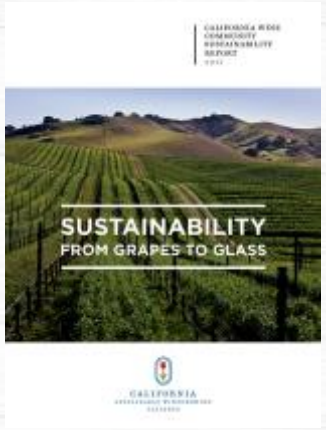
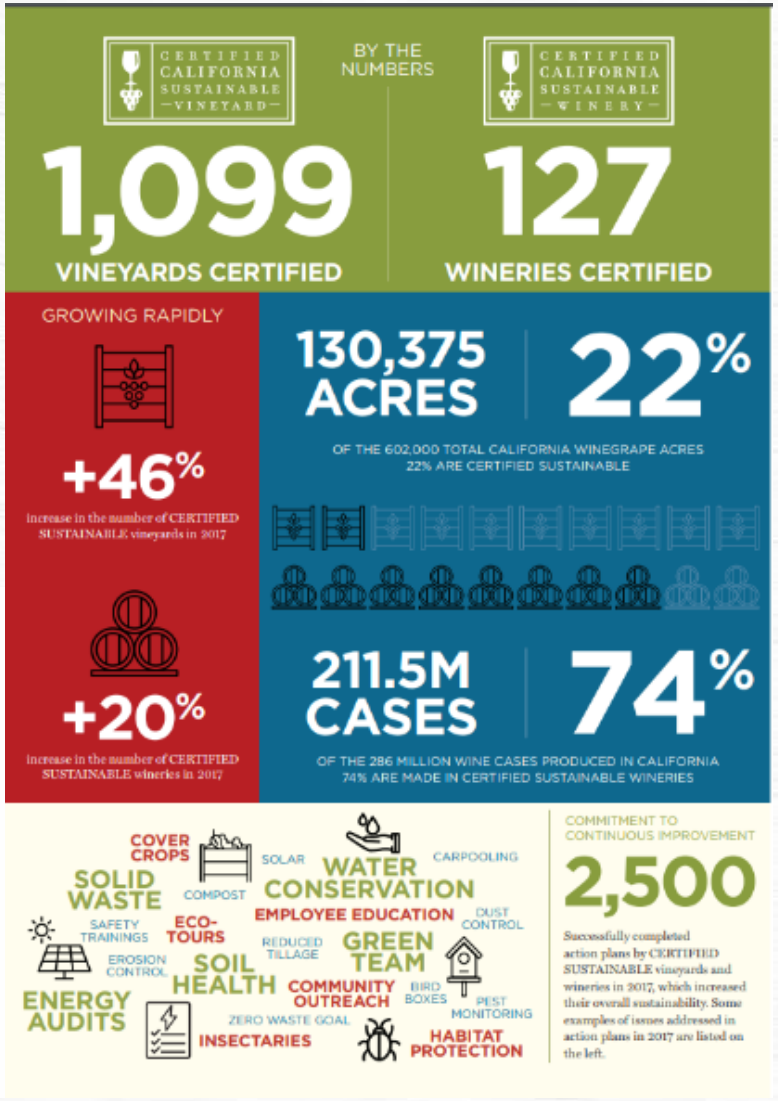
CSWA Success and use in the Industry

CERTIFIED CALIFORNIA SUSTAINABLE WINEGROWING





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Deep Dive on Water

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Water Management Concerns

Statewide Precipitation Statistics:

CALIFORNIA PRECIPITATION SLIPS A NOTCH

The latest rain/snow season (October-March) ranks as the second wettest for this time of year in California since record-keeping began 122 years ago. It was ranked the wettest in February.

Rank and season	Total precipitation
1. 1982-83	34.38"
2. 2016 -17	**30.75"**
3. 1997-98	30.61"
4. 1994 -95	30.51"
5. 1937-38	30.35"
6. 1968-69	28.73"
7. 1940-41	28.48"
8. 1977-78	28.08"
9. 1906-07	28.06"
10. 1951-52	27.25"

Source: NOAA's National Centers for Environmental Information

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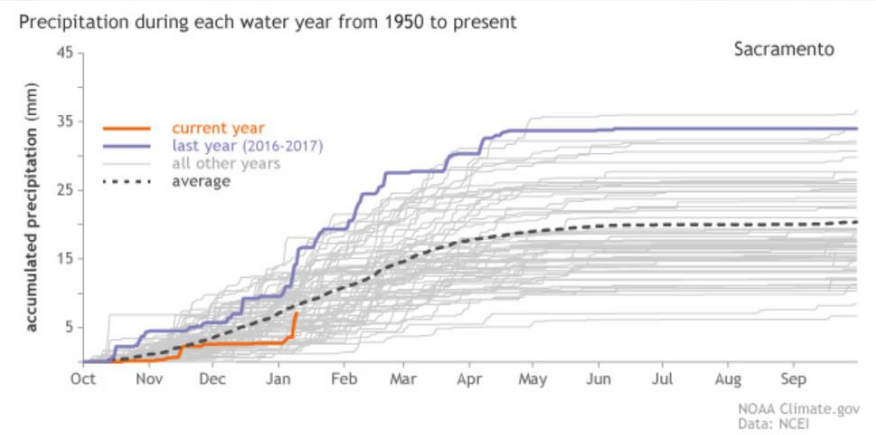

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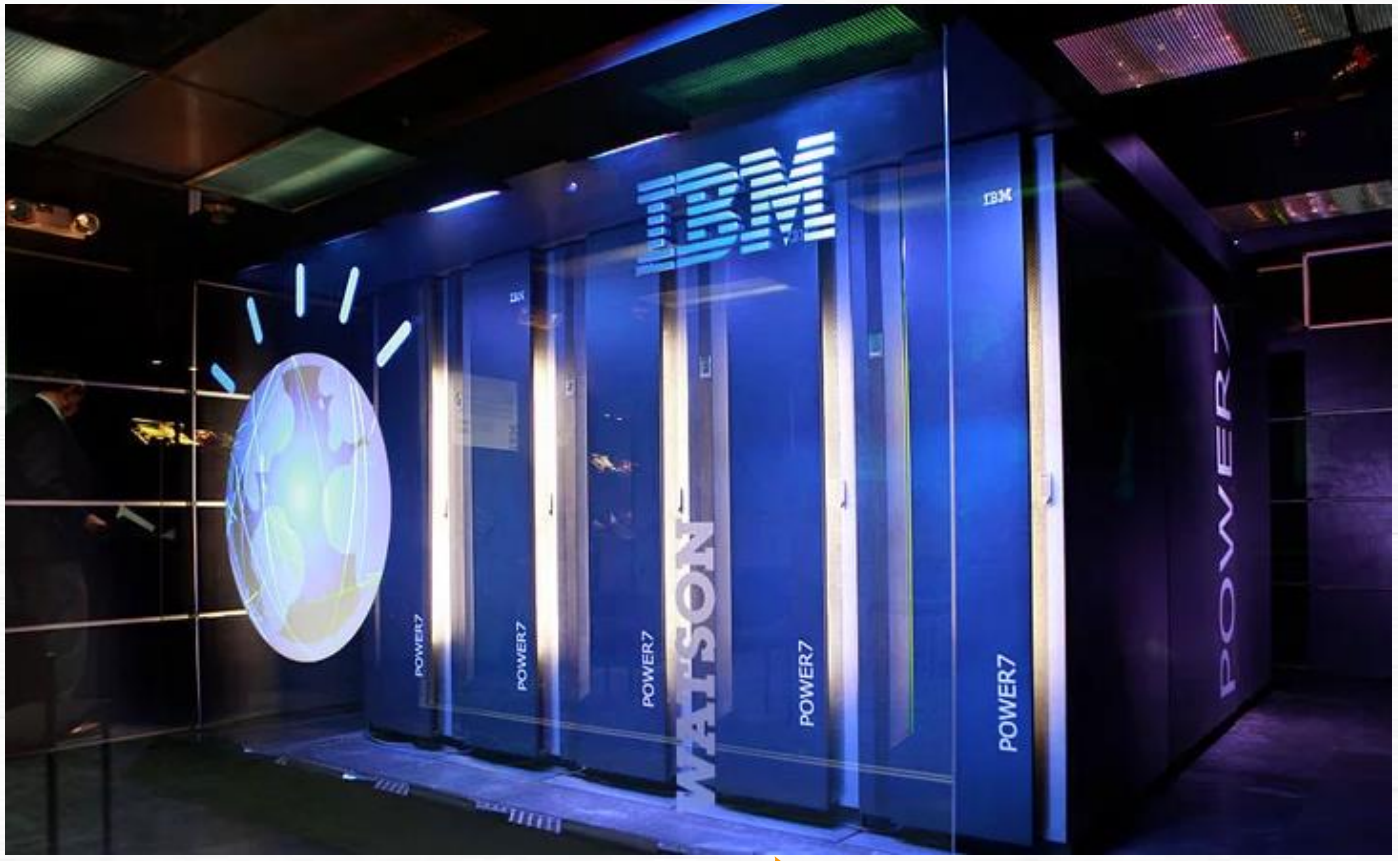
IBM's Watson super computer learned to become a master winemaker

E. & J. Gallo Winery tested a new irrigation system developed with IBM to grow grapes using less water. The plan is to eventually apply the lessons learned to Watson so that IBM's data crunching technology can help farmers around the world.



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"Water conservation has been a central focus."

-Dr. Nick Dokoozlian, Vice President, Viticulture, Chemistry and Enology

Even before teaming with IBM, Gallo had used some cutting edge technology to make its huge farming operations more efficient. Data scientists working for the company routinely analyzed satellite imagery of nearly 20,000 acres of grape vines to judge their health.

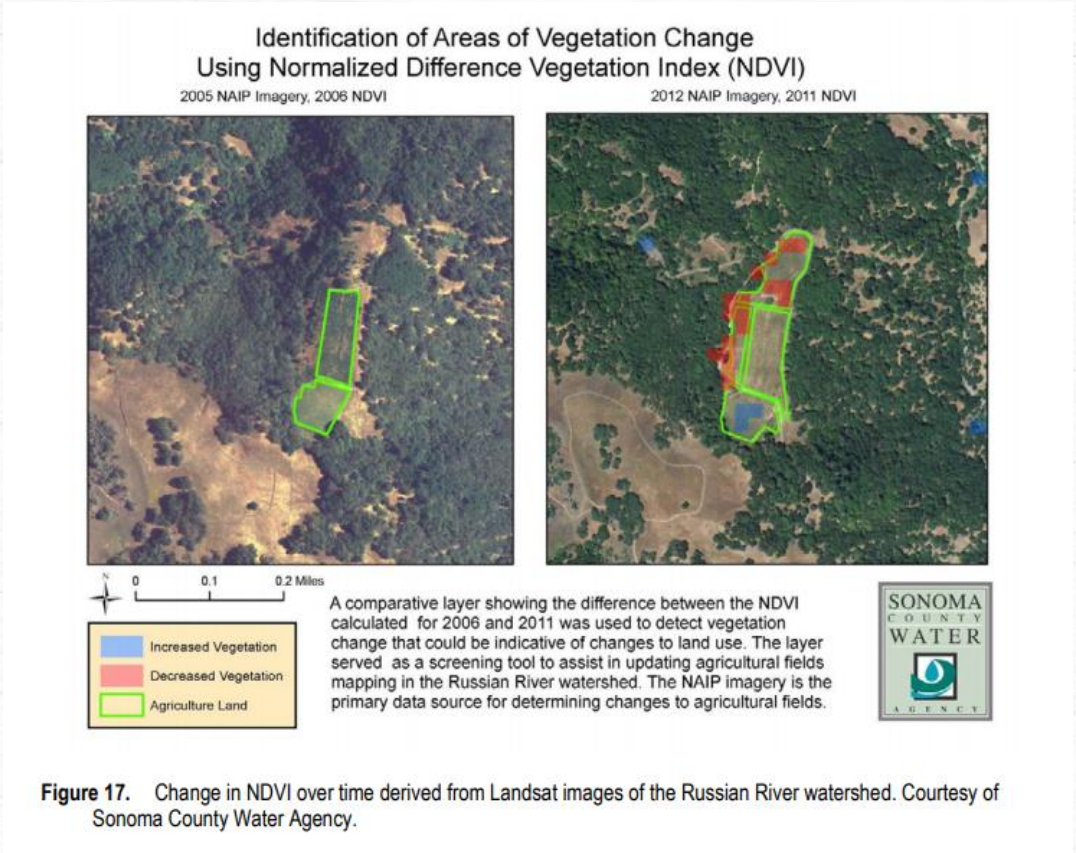

Figure 17. Change in NDVI over time derived from Landsat images of the Russian River watershed. Courtesy of Sonoma County Water Agency.

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"This is *Star Wars* technology."
-Dr. Nick Dokoozlian

Based on satellite imagery, Dokoozlian could see that some vines could be healthier. But sending workers to water individual plants would be too much work.

To solve the problem, Dokoozlian tapped IBM to help Gallo create a customized irrigation system that could automatically water small sections of vines based on the analyzed satellite data. The irrigation system combines the vineyard's data analysis with customized hardware.

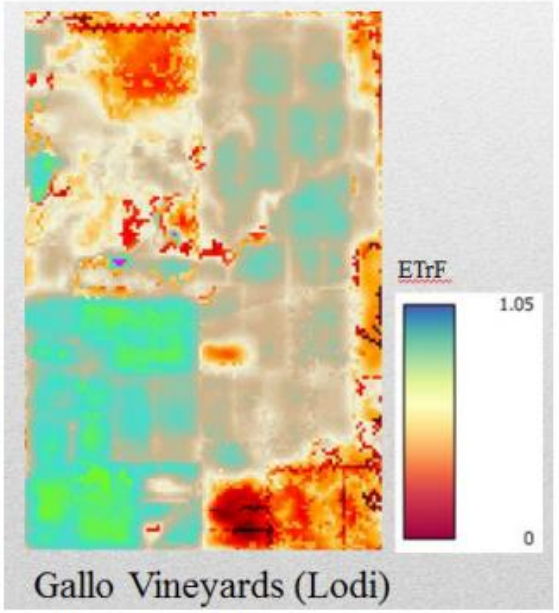
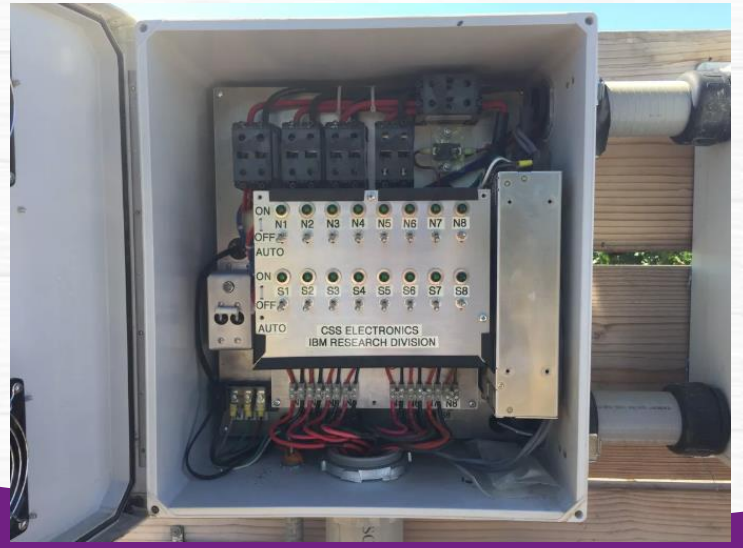
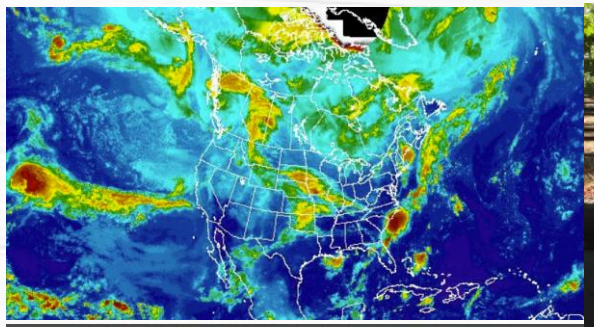


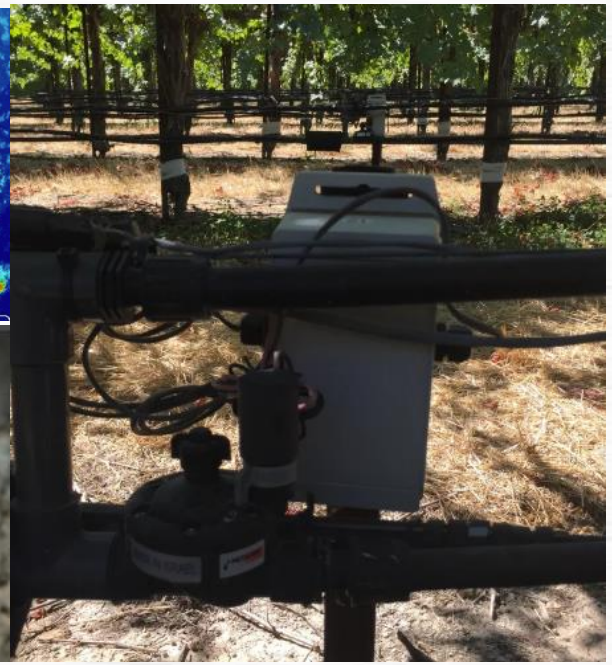
Figure 18. Evapotranspiration from Gallo vineyards in Lodi, California, measured using an adjusted form of METRIC. Lower evapotranspiration is shown in red and higher is in blue. Courtesy of E. & J. Gallo. (ETrF, reference evapotranspiration)



How a vineyard is working with Watson

- Watson ingests data from weather, satellite, and sensor data on the IBM Cloud.
- The data helps identify conditions in the vines and atmosphere.
- After determining specific needs of the vines, given situational data, the system adapts irrigation levels.
- The watering is tailored for precise areas to ripen grapes in sync and with improved quality.





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Success can be measured…

Because of this tailored watering, E. & J. Gallo Winery ***reduced its water use by 25%,*** while also improving the quality of its wine.

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What Does the Future Hold?

What Additional Insights Can I Provide?

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