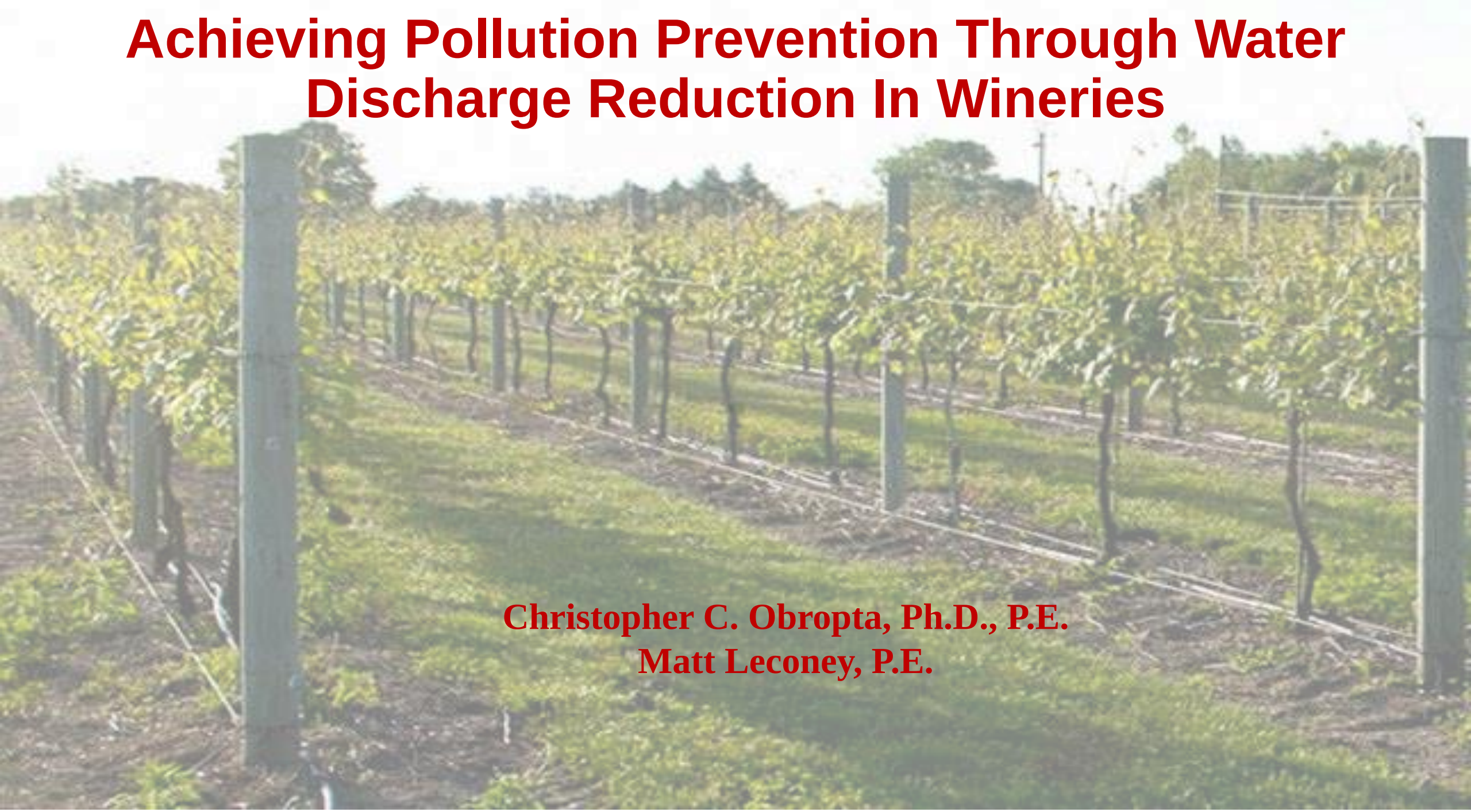
Achieving Pollution Prevention Through Water Discharge Reduction In Wineries



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Sustainability in NJ Wine Industry

- conserve water and energy
- maintain healthy soil
- protect air and water quality
- enhance relations with employees and communities
- preserve local ecosystems and wildlife habitat
- improve the economic vitality of vineyards and wineries

Waste and Wastewater Management for NJ Wineries Best Management Practices Manual

1. Wastewater from cleaning equipment and sanitation
2. Solid waste associated with crushing and pressing operation
3. Domestic waste associated with employees and people visiting the tasting room (and larger winery events)

Water Use at the Winery

- Irrigation
- Temperature control
- Cleaning
- Sanitation
- Sterilization
- Filter rinsing

Wastewater from cleaning equipment and sanitation

- Chemical and biochemical oxygen demand (COD and BOD)
- Total suspended solids (TSS) and total dissolved solids (TDS)
- Salts such as sodium (Na), Calcium (Ca), Magnesium (Mg), and Potassium (K)
- Nutrients such as Nitrogen (N) and Phosphorus (P)
- Acidity or alkalinity (pH)
- Dissolved oxygen levels (DO)

Rinse water is the largest contribution to the wastewater stream from a winery

- Crushing and Pressing Operations
  - COD concentrations 800 to 1,500 mg/l
  - TDS concentrations 80 to 2,900 mg/l
- Tank Washing
- Barrel Washing

Methods for Wastewater Disposal

- Discharge to municipal sanitary sewer system
- Discharge to septic system
- Land apply the wastewater to the agricultural fields

Domestic waste associated with employees and people visiting the tasting room

- Septic System
  - Regulations states 15 gallons per day for e… per day for each seat/person up to the max…
  - Standard septic system can handle 350 gal…
  - 350 gal/day = 3 employees and 100 peopl…
- Portable toilets or temporary restrooms … single events

EPA Pollution Prevention Grant

- 4 wineries: 2 larger scale and 2 smaller scale
- Study participants remain anonymous in all data reporting
- Research focus is on winery production side, not tasting room or vineyard

Funded by USEPA Region 2.
FY 2020 and FY 2021 Pollution Prevention Grant Program EPA-HQ-OPPT-2020-001

"PROVIDING TECHNICAL ASSISTANCE TO NEW JERSEY WINERIES: ACHIEVING POLLUTION PREVENTION THROUGH ENERGY EFFICIENCY AND DISCHARGE REDUCTION FROM WINERY OPERATIONS"

National Emphasis Area Supported: #1 Food and Beverage Manufacturing and Processing

Water Research Goals

- Identify existing water use and determine areas to conserve water
- Identify chemical use and provide suggestions for more environmentally friendly alternatives
- Look at existing wastewater treatment systems to determine their effectiveness and suggest more efficient alternatives.

Water Use Survey

- Distributed survey to wineries to determine baseline water use and chemicals used

Winery Name:	
Primary Contact Info:	
Date:	
Note: Rough estimates are fine, these numbers are for preliminary estimates.	
1. Water Source	
a. Is water used during the winemaking process from a well or municipal supply?	
b. Is water source used during the winemaking process separated from water used in tasting room activities?	
c. Does the water used during winemaking need to be pre-treated? If so, how?	
2. Water bills (if applicable)	
a. Please provide copies of the winery's 2020 monthly water bills.	
b. If the bills include uses other than wine production, what percentage (estimated is fine) is for other uses?	
3. Chiller	
a. How many Chiller tanks do you have and what is their average size?	
b. How many times per year is each tank rinsed on average?	
c. Where does this rinse water go?	
d. What, if any, chemicals are used to rinse/clean with?	

Water Use Monitoring

- Installed water meters with digital loggers
- Asked wineries to keep a log of daily water use
- Characterizing each day's activities to particular water uses
- By comparing wineries, should provide insights on how scale and procedures affect water use.

Water Quality Sampling

- Characterize wastewater stream
- Identify key pollutants
- Determine approximate total loads based on water use
  - Hope is that if sample concentrations are high, total loads are relatively low

Waste Quality Sampling

- Taking samples from following areas:
  - Crusher/Destemmer
  - Press
  - Tank Rinsing
  - Barrel Washing
  - Transfer Pump Rinsing
  - Filter Rinsing
  - Source Water

Wastewater Discharge

- Determine the level of treatment the system/procedure provides
- Determine where water is currently being discharged
- Determine if/how treatment processes could be improved to satisfy EPA and NJDEP

Expected Research Outcomes

- Identify how wineries can conserve water
- Recommend environmental friendlier chemicals
- Determine how much treatment is needed for winery wastewater

Overall Outcomes (our hopes)

- Data to demonstrate how minimal the environmental impact is from NJ's wineries
- NJDEP directs their attention on other industries that have a much larger environmental impact
- We get to sample good wine

What actions can Wineries take now?

- Conduct your own water and chemical use audit
- Install a water meter to track water usage
- Consider low flow nozzles and washing procedures to reduce water usage
- Consider switching to more environmentally friendly chemicals
- Capture and reuse of rinse water and cleaning solutions where possible

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Questions?

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