





An example of climate service application in agriculture

# **VISCA DSS**

#### **Climate Sprint**

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### Introduction

- Agriculture is a highly dependent sector on heat, sunlight and water, and therefore very sensitive to climate change, not only in the Europe but globally.
- According to climate projections, weather events are very likely to become more extreme and frequent overpassing agriculture's adaptation limits.
- Even if **policies** and efforts to reduce emissions prove effective, impacts of climate change are inevitable.



Strategies and actions to adapt to climate change impacts are needed.







### Introduction

- **Premium wine-grapes** are threatened since grapevines are extremely sensitive to their surrounding environment directly affecting the European wine industry.
- Direct and indirect economic activity linked to winemaking and the commercialization of wine is the main economic activity of regions from South of Europe.



(Areas in red had extreme heat and drought stress in 2015.)

Source: Conservation International <u>http://winefolly.com/upd</u> <u>ate/climate-change-vs-</u> <u>wine-a-snapshot-of-year-</u> <u>2050/</u>



Researchers expect big changes in regions enjoying the cool winters and hot dry summers that produce good grapes. "It will be harder and harder to grow those varieties that are currently growing in places in Europe," Hannah said. "It doesn't necessarily mean that [they] can't be grown there, but it will require irrigation and special inputs to make it work, and that will make it more and more expensive."



her

ai



study has found sharp declines in wire production from Bandway, Rhane and Taucang, as well as Califi Valley and Chile by 2050, as a warning climate makes it harder to raise grapes in traditional wire cour graph: Ceptine Taurus Clarety / Jamry/Slamy

Bid adieu to Bordeaux, but also, quite possibly, a hello to Chateau Yellowstone. Researchers predict a two-thirds fall in production in the world's premier wine regions because of climate change.

The study forecasts sharp declines in wine production from Bordeaux and Rhc regions in France, Tuscany in Italy and Napa Valley in California and Chile by 2050, as a warming climate makes it harder to grow grapes in traditional wine

#### La guía definitiva para seleccionar acciones

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### Introduction

- In EU Farming employs over **20 million** people in the EU (Eurostat, 2015).
- Between 2013 and 2017, the average annual production was 168 million hectolitres.
- The European Union is the World leading producer of wine.



Source: 2015, OIV/ ceev http://www.ceev.eu/i mages/documents/pr ess\_releases/2016/Br ochure\_CEEV\_-\_\_\_\_\_\_High\_resolution.pdf

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### **Brief Overview**

- VISCA: Vineyards' Integrated Smart Climate Application – H2020 project.
- **Total Budget:** 3,2 M€ / Awarded Grant = 2,8 M€
- Duration: 36+7 months (01/05/2017-30/11/2020)
- Consortium composition:
- 11 partners from 5 countries









#### **Partners**

#### • 3 end-users – large winegrowers:

– CODORNIU, MASTROBERARDINO, SYMINGTON

#### • 3 scientific/research entities:

- IRTA, UNINA, UPORTO
- 1 ICT solutions provider:
  - Links Foundation
- 2 climate data providers:
  - METEOSIM, BSC
- 1 dissemination partner:
  - SEMIDE
- 1 exploitation partner:
  - ALPHA CONSULT









### **VISCA Project**

- VISCA provides a Climate Service (CS) and Decision Support System (DSS) that integrate climate, agricultural models with farmers' management specifications in order to design short-, medium- and long-term adaptation strategies to climate change.
- The main objective of VISCA is to make European wine industries resilient to climate changes while minimizing costs and risks through an improvement of the production management.









#### **DSS** architecture









#### Added Value:

#### **Unique integrated access to information**

- Information on specific crop planning aspects (budburst, harvesting, defoliation, pruning, etc.).
- Plan for the irrigation frequency and amount according to the needs of the plants.
- Access to short -, medium-term and seasonal weather forecasting optimised for the location of the vineyard.
- Recommendations integrating weather forecasts into phenological and irrigation prediction.









# Weather forecasts (Short-medium and seasonal)

- Plan and smartly schedule critical in-field farmers activities
- Integration of weather forecasts and in situ measurements into phenological and irrigation prediction models for better accuracy
- Weather/climate forecasting optimised for the location of the vineyard
- Warning against (short-term) extreme events







### Map graphic interface





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730253.

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### **Irrigation forecasts**







Allowing the farmers to plan for the irrigation frequency and amount according to the needs of their crops



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#### Phenological prediction



- Information on crop development phases (budburst, harvesting, defoliation, pruning, etc.)
- Take into consideration winegrowing technics (e.g. crop forcing) and desired quality (e.g. sugar level)









#### **Parcels details**

1 of 16	
General Information   Lifecycle 2019  Desired Values  Desired	Values 🖍
Experimental     YES     BB Bud Break 2019-06-29     Sugar Level     23     Post Harv	vest threshold 0
Grape variety Chardonnay Acidity Level From 8 Preverais	on threshold 0
Facing (°) 3 Biodining 2019-07-31 Acidity Level To 12 Veraison	threshold 0.5
Line spacing (m) 2 Alcoholic Level 14 Unit of M	easure -
Plant spacing (m) 2 Vield 8000	
Trellis VSP VR Veraison Prediction	on
Orientation (°) 13	
Soil Texture SILTY RP Ripening From	Nov 7, 2019
Soil texture (% sand) - To	Nov 7, 2019
Soil texture (% silt) - LF Leaf Fall Acidity Level - Stress	0
Soil texture (% clay) - Alcoholic Level -	
Rock fragments 10 Technology Yield	
Soil depth (m) 1	
Slope (%)     Achieved Values     Prediction	
Trunk height (m) 1.2	
Rootstock NULL Sugar Level X 27.6458	
Canopy Mgmt. Type -	
Canopy Mgmt. % -	







### **Agronomic technics integrated**

## **Crop Forcing** To delay Harvest dates

**Phenological and Irrigation strategies:** Validation and Calibration











### Replicability

#### • Replicable for vineyards:

- In Italy, Spain and Portugal
- Specific types of grapes

#### For other sectors (olives, rice and cereals) in Europe and beyond

- Adaptation of phenology and irrigation models
- Weather and climate forecasts models to be generated for other countries





#### Thank you for you Attention!

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#### www.visca.eu



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