

CLIMAT- Amsud (21 CLIMAT-01)

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High-resolution scenarios for vineyard adaptation to climate change: application to Argentinean and Uruguayan viticulture. (CliAmWine).

Project Coordinator: Hervé Quenol (France).

Argentina National Coordinator Mario Nuñez

CIMA Participants: Mario Nuñez, Fernanda Cabré

Project Goals

In viticulture, climate warming has a very significant impact on the plant's development and on the quality and characteristics of wines, at different scales ranging from global to local. With a view to adapting winegrowing to climate change, climate models can be used to define scenarios, but only at the scale of major wine regions. Despite the huge progress made in the last ten years in terms of the spatial resolution of climate projections (narrowed down to a few square kilometers), they are not yet sufficiently precise enough to take into account the influence of local parameters (such as topography and soil types), although these parameters are decisive for the vine's and wines' characteristics. Combined with regional climate scenarios, analyzing the spatial variability of local climate makes it possible to fine-tune the models' spatial resolution and to propose rational adaptation methods at the level of the estate rather than at the level of major wine regions.

The main goals are:

- - To create high-resolution future-simulated bioclimatic and phenological data to provide information directly relevant to the wine industry at the scale of vineyard.
- - To develop climate change adaptation scenarios based on local climate variability and winegrowers' cultural practices.
- To enable the design of climate change adaptation strategies adapted to the needs of winegrowers.
- To produce guidelines to the attention of wine-professionals and stakeholders. This guideline will include description and information on the various techniques and methods developed by the project. More specifically, the guidelines will include a description of the concrete adaptation to climate techniques and their effectiveness based on the results acquired from pilot sites.

ABSTRACT

Global climate change affects regional climates and has implications for viticulture worldwide. Various studies have addressed the issue of the impact of climate change on viticulture in many wine-growing regions of the world, but few studies are devoted to the observation and simulation of climate and climate change at the vineyard level (local scale). However, variations in vine growth and differences in grape/wine quality are often observed over short distances in a wine-growing region and are linked to local characteristics (slope, soil, seasonal climate, etc.). The high spatial variability of climate caused by local factors is often of the same order or even higher than the temperature

increase simulated by the different IPCC scenarios. The winegrowers can adapt to this spatial variability of the climate, notably through their cultivation practices. In the context of climate change, prior knowledge of the spatial variability of climate at fine scales is an asset for defining possibilities for adaptation to the temporal evolution of climate in the medium to longer term. This multidisciplinary and international project aims to produce fine-scale climate change adaptation scenarios by combining simulations of future climate (2031-2050 et 2081-2100) with vine growth models and viticultural practices. These scenarios will be constructed and applied in Argentinean and Uruguayan wine-growing regions where several pilot sites are already being studied by the project teams.

The main questions are: How can spatial variability of local climate be integrated into climate change scenarios? How can we propose methods to the wine industry for adapting to climate change at the vineyard level? To meet these objectives, the XXX project consists of 3 Work packages: (1) Agroclimatic measurements at the scale of experimental vineyards; (2) Agroclimatic modelling at the scale of vineyards in the context of climate change; (3) Modelling environmental impacts on viticultural ecosystems: adaptation strategies for the wine industry.

PARTICIPANTS INSTITUTION

ARGENTINA

- CIMA (CONICET/UBA).
- Facultad de Ciencias Agrarias. Universidad Nacional de Cuyo.

URUGUAY

- Facultas de Agronomía. Universidad de la República.

FRANCE

- UMR6554LETG CNRS.

NOTE: The project has been postponed one year because of COVID.