

Global Climate Change Influences Wine Production and Tourism in Northern New York

There is existing literature on the economic impacts of global climate change on wine production and wine tourism using qualitative meta-analysis of current climate modeling and qualitative analysis on regional brand equity for wine. Our research applies these models to forecast a possible future for New York State as an emerging area for wine tourism and the traditional wine regions in Western Europe and parts of North America will experience a considerable reduction in production by 2050 and others including Northern New York will experience an increase.

Where is Northern New York?

Northern New York region is made up of 11,913.57 sq. miles with varying landscapes including waterways and mountainous areas. It includes seven counties: Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis and St. Lawrence. It is known for being the largest economic development region when measured by land mass with the smallest population measuring 433,193 in the 2010 census.

What is the climate in NNY?

- The temperatures vary greatly between winter and summer months. The average temperature during the summer months (June, July, August) is 68.5 F. Comparatively the winter months (December, January, February, March) average temperature is 22.1 F.
- The winters are cold with heavy amounts of precipitation generated from winds that travel over Lake Ontario, one of the great lakes. The annual precipitation for Jefferson County is 43.10 inches.

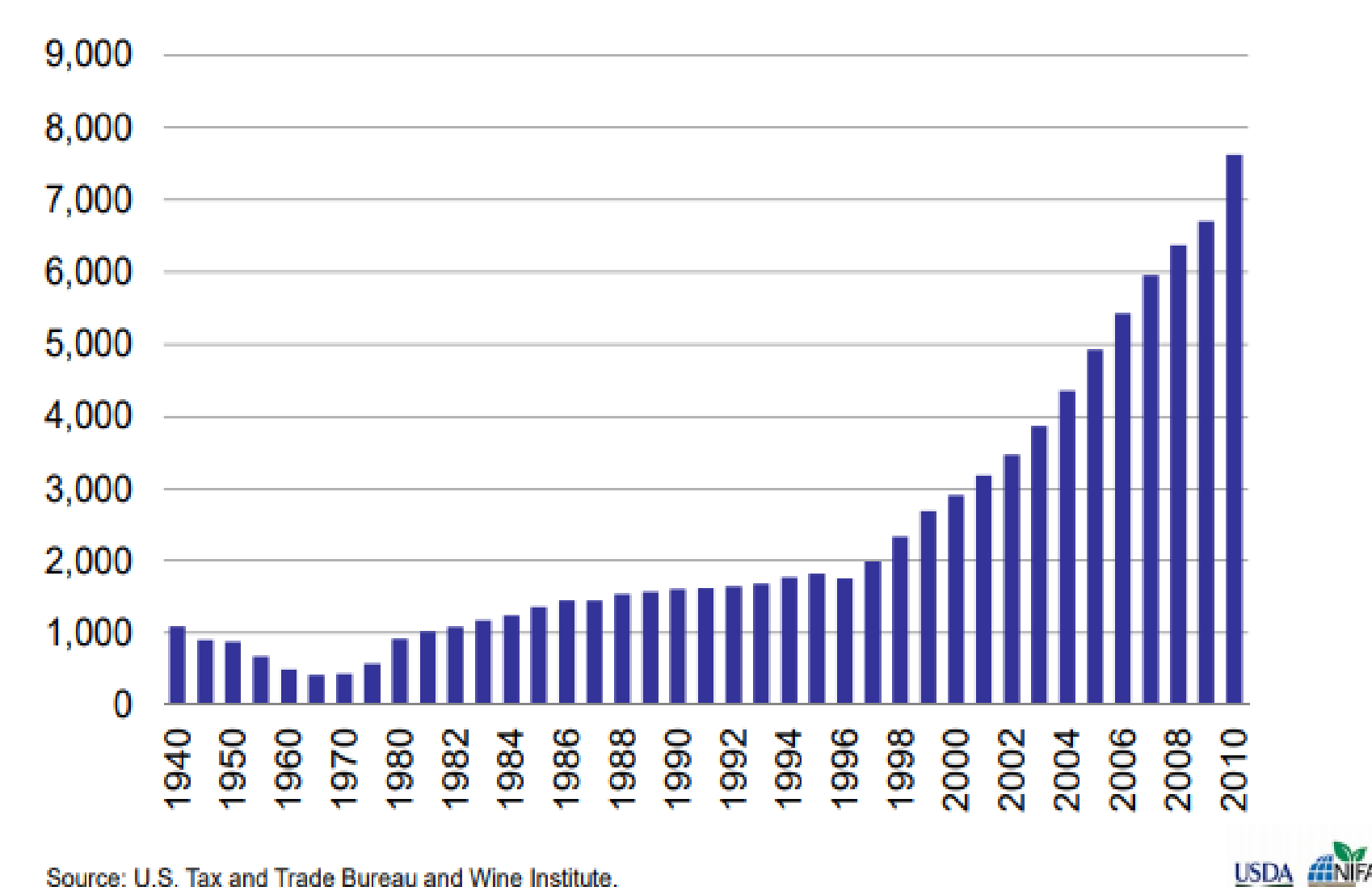
- The climate in NNY has posed significant challenges for wine producers and tourism in the region.
- The NYS Department of Environmental Conservation notes an increase of average temperatures in all regions of the state. An increase of 2.4 F for average temperature and 4.4 F for winter warming.
- Due to climate change the temperature is estimated a minimum increase of 6 degrees by 2050 and 10% by 2080. An increase of precipitation is also estimated to be 15% by 2080.
- Challenge: how will future climate change impact viticulture and wine tourism in NNY?

How is the wine market in NNY compared to the U.S.?

- The U.S. wine market totaled \$62.2 billion in retail sales in 2017. As of 2018 there were 9,654 wineries in the U.S.
- California accounts for 86% of the total wine production in the U.S. with 4,391 wineries.
- Oregon has 774 wineries followed by Washington State and New York State as the next two largest wine growing regions in the U.S.
- New York has 450 wine facilities and receives 4.5 million wine tourists annually which directly impacts the economy with \$13.8 billion in activity. The increasing and improving wine tourism in Northern New York will have a major positive impact on the local and state economy.
- NNY has a total of 29 wineries with a majority opening within the last decade.



Number of Wineries in the U.S.



Source: U.S. Tax and Trade Bureau and Wine Institute.



Strategic Recommendations

Wine tourism in NNY area is growing due to the popularity of the new developments made from the grape growing industry. Climate change will continue to influence grape growing and the wine industry. Climate models show that temperatures are going to continue to rise allowing the area to expand the type of grapes able to be grown in the region. Warmer weather patterns have prolonged the period of frost-free days in the last 6-8 years. Cape Vincent experienced no frost during the growing season. Many local wineries are considering the recent changes in the climate and are planning for future climate change, monitoring weather data and forecast adapting their growing processes accordingly. Wineries are actively investigating new varieties and growing techniques to increase the quality and variety of their wines. Accommodating warmer temperatures, longer growing season and variable rainfall, diversification into new grape varieties will occur. Weather tracking is essential for vineyards to adapt to changing weather conditions. Many have programs in place that market wine tourism industry in NNY. Wineries entering wine competitions have raised awareness to the grape varieties being grown in the region. The Grape & Wine Foundation promotes local wineries through social media, press releases and newsletters, and provides links to each vineyard's website.

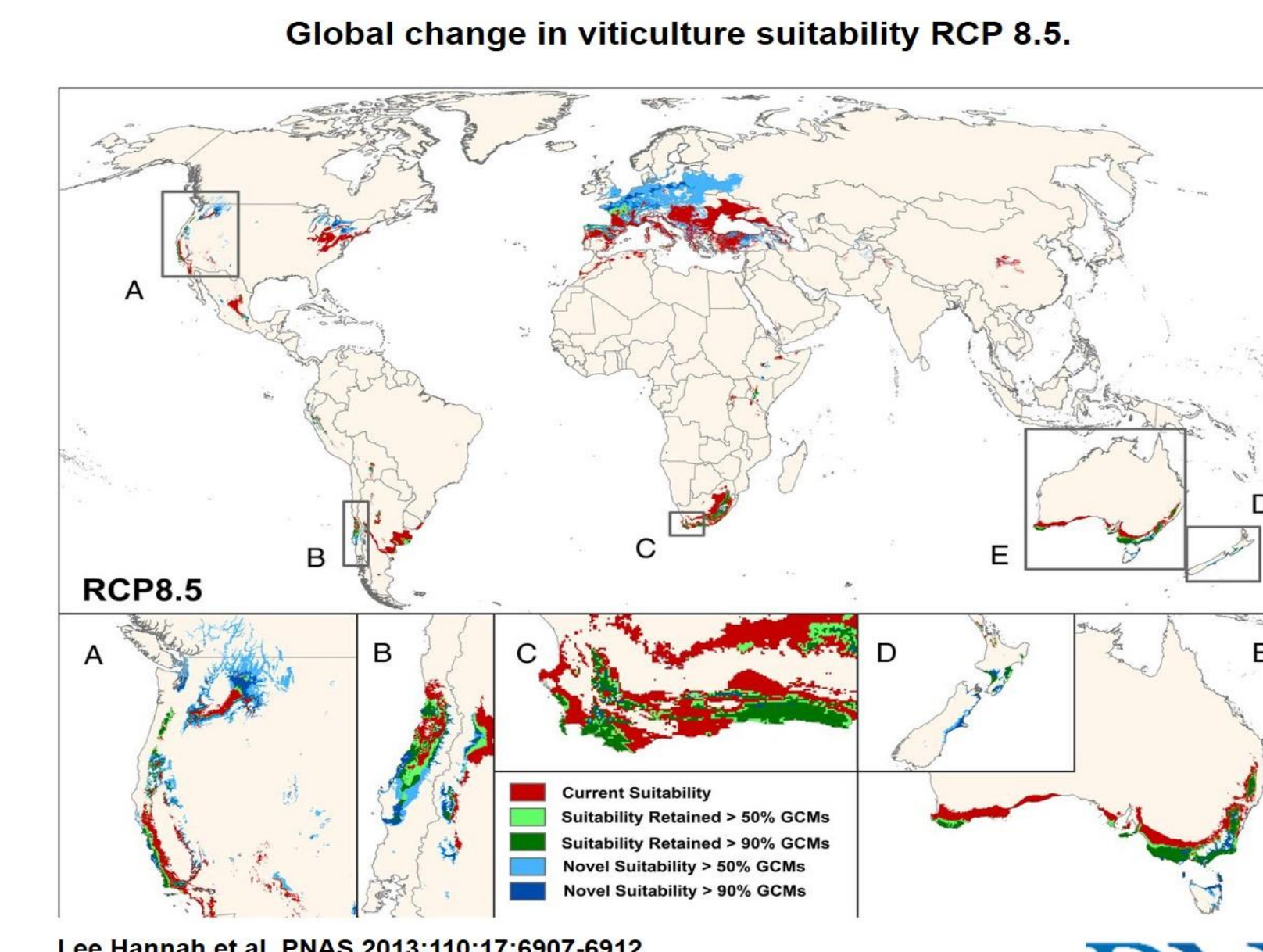
Methodology- Interviews

- In what ways, if any, has climate change affected wineries of this region?
- What measures, if any, have winery operators taken to minimize the perceived effects of climate change?
- How do you think climate change will affect tourism in the wine market?
- How does it affect wine production?
- What have you done to adapt to the current climate?
- How will you adapt to future effects of climate change?
- What activities have you implemented to promote wine tourism?
- How do you describe our current wine market?
- What is your outlook of wine tourism in the region for the future?

What is the purpose?

Examine existing literature regarding the effects of climate change on viticulture, wine tourism and regional brand equity for wine and apply these models qualitatively to forecast a possible future for New York State, USA as an emerging wine tourism area.

What is the problem?



Lee Hannah et al. PNAS 2013;110:17:6907-6912

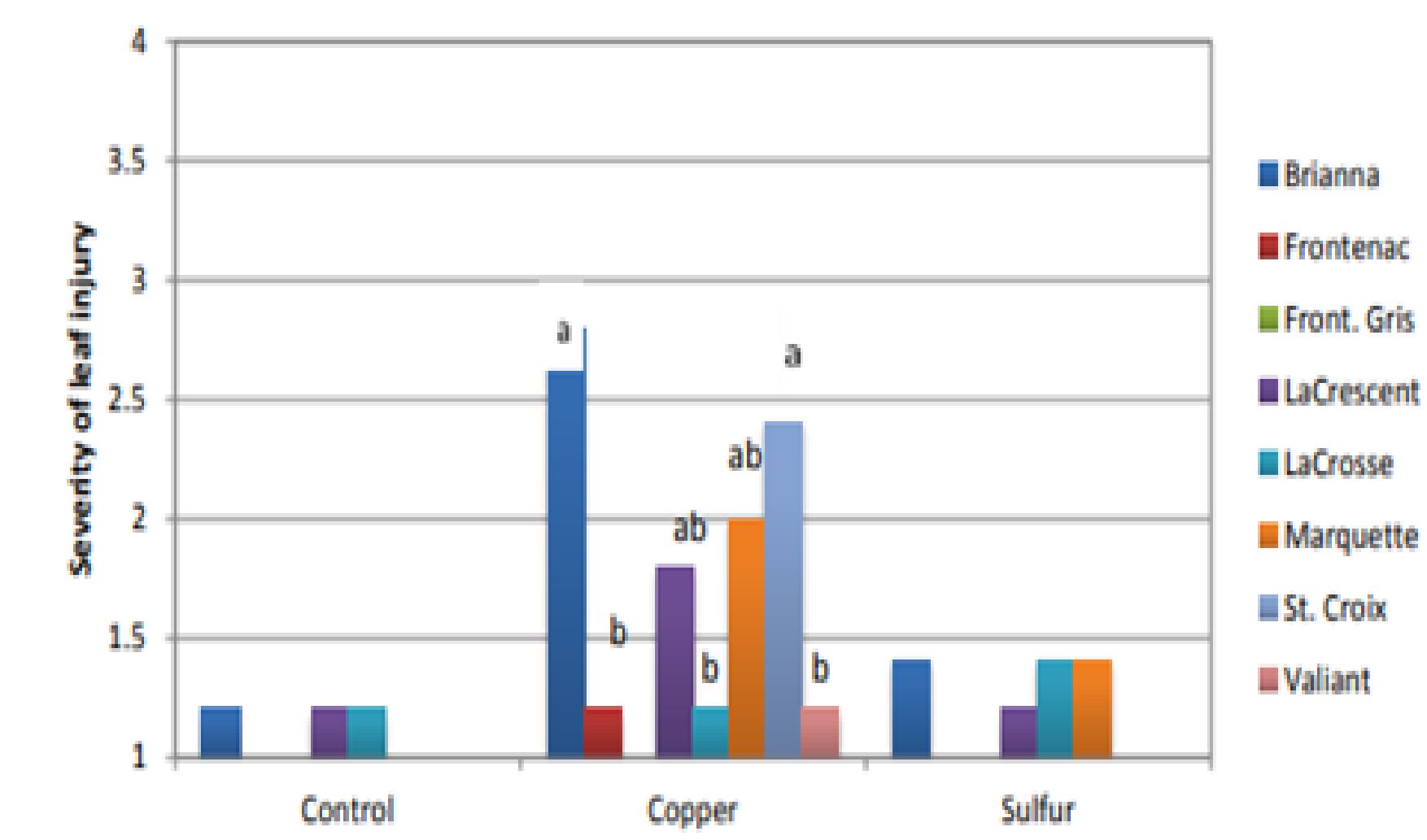


What should the world expect?

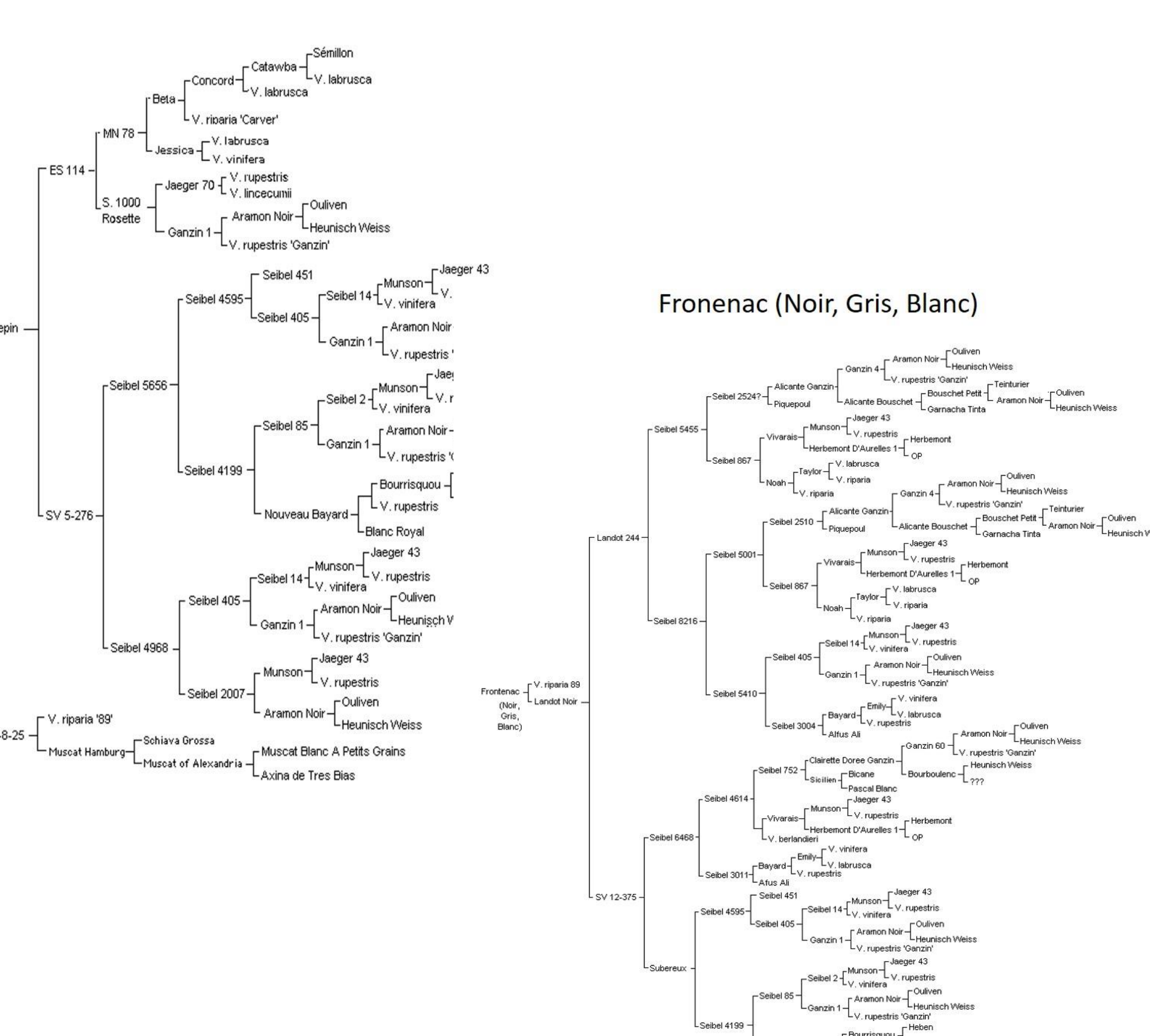
Global warming has increased the global temperature by 1.4 F since 1900 and if efforts are not met to address and mitigate the cause of global warming, the average global temperatures could escalate 11.5 F in the 21st century. The consequences include stronger weather events, altered global weather patterns including droughts and water shortages, rising sea levels, serious farmland reduction, population displacement, and a dramatic increase in insect population and insect-related diseases. Increasing temperatures combined with a reduction in the availability of fresh water in the next 50 years may result in a 50% loss of land in Napa, California, as well as Santa Barbara County, California.

What have we learned from research?

There is very little research regarding climate change and viticulture in eastern North America, but a study was performed regarding the effects of climate change on viticulture in Quebec, Canada spanning over 31 years. The weather is similar to NNY which makes this a valuable comparison.. The study examined over 40 vineyards and found that the rising temperatures have affected grape production. The wineries are now able to grow *Vitis vinifera* varieties due to the region becoming warmer and winters are not as harsh with less intense cold days on record. The growing season is lengthening with fewer days of frost and the mean minimum temperature increased. This trend is expected to continue, allowing greater success for vineyards in Canada. The west coast wine regions will not be able to grow the *Vitis vinifera* varieties because the temperatures will be too harsh for the grapes. New York is an emerging market for wine production and tourism.



La Crescent



Brianna ES (7-4-76)

Marquette

