Effects of El Niño and the North Atlantic Oscillation on Zinfandel and Primitivo wine quality in Santa Rosa, California and Manduria, Italy

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Senior Integrative Exercise
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ABSTRACT

Sonoma County, California and Manduria, Italy are two of the world's largest producers of Zinfandel and Primitivo wine. In California, climate is affected by the El Niño-Southern Oscillation (ENSO) cycle, while Italy sees effects from the North Atlantic Oscillation (NAO). Climate data from 34 years were used to give average temperatures during the summer and winter months crucial to grape growth. Precipitation data for these months were also analyzed. These data were compared with documented El Niño years and years with a positive NAO index for evidence of climatic cyclicity. Using averaged wine quality ratings for California Zinfandel and Italian Primitivo, I compared years under the influence of one of these climate cycles with the wine produced in that year. This shows that neither El Niño nor NAO seem to be controlling the quality of wine produced in either of these regions, possibly due to human influence in the form of irrigation, an insufficient number of vintage charts, or the weakness of climatic cyclicity in the climate data.

Keywords: Zinfandel, Primitivo, El Niño, North Atlantic Oscillation, wine quality, cyclic climate change