



ECA&D: A high-resolution dataset for monitoring climate change and effects on viticulture in Europe

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Climate has a significant impact on wine quality variations and grape yield. Next to the year-to-year variations in climate, climate change will lead to persistent changes in temperature and precipitation patterns which will affect the characteristics of wine produced in each region. The European Climate Assessment and Dataset (ECA&D) is a tool to monitor climate variability and trends over Europe.

ECA&D is a dataset with daily station data for nearly 6600 stations in Europe, the Middle East and Northern Africa and includes temperature, precipitation, sunshine duration and other elements. The station data are validated and provided by the European Meteorological Services.

Based on the daily station data, the Huglin and Biologically Effective Degree Days indices are calculated and provides an unparalleled dense coverage of these viticulture related indices. Next to these, averaged temperatures over the growing season are calculated. For five selected grape varieties threshold values for these indices are used which characterize the minimum warmth at which cultivation of these grapes is possible.

The study quantifies the timing and the extent of the expansion of the regions in Europe where these grapes can be used for viticulture. For all grape varieties analyzed, the expansion is northward and eastward, with conditions in the Balkan peninsula improving rapidly.

Areas in southern Europe are indicated where climate is becoming too hot to produce high-quality wines. This applies to the northeastern part of Italy and Southwest France in regions like Bordeaux, Bergerac and Cahors where conditions for Merlot noir are getting less optimal.

The derived data in ECA&D, like the indices, trends, anomaly maps and part of the daily data are freely available for scientific research at www.ecad.eu.