

## **Climate Signal Detection in Wine Quality Using Gridded vs. Station Data in North-East Hungary**

Janos Mika, Andras Razsi, and Lajos Gal  
Eszterhazy Karoly University, Eger, Eger, Hungary

The grapevine is one of the oldest cultivated plants. Today's viticultural regions for quality wine production are located in relatively narrow geographical and therefore climatic niches. Our target area, the Matra Region in NE Hungary is fairly close to the edge of optimal wine production concerning its climate conditions. Fifty year (1961-2010) wine and quality (natural sugar content, in weight % of must) data are analysed and compared to parallel climate variables. Two sets of station-based monthly temperature, sunshine duration and precipitation data, taken from neighbouring stations, Eger-Kőlyuktető (1961-2010) and Kompolt (1976-2006) are used in 132 combinations, together with daily grid-point data provided by the CarpatClim Project ([www.carpatclim-eu.org/pages/home](http://www.carpatclim-eu.org/pages/home)). By now it is clear that (1) wine quality, is in significant negative correlation with the annual precipitation and in positive correlation with temperature and sunshine duration. (2) Applying a wide combination of monthly data we obtain even stronger correlations (higher significance according to t-tests) even from the station-based data, but it is difficult to select an optimum model from the many proper combinations differing in performance over the test sample just slightly. (3) The interpolated site-specific areal averages from the grid-point data provide even better results and stronger differences between the best models and the few other candidates. (4) Further improvement of statistical signal detection capacity of the above climate variables by using 5-day averages, point at the strong vulnerability of wine quality on climate anomalies of some key phenological phases of the investigated grapevine-mixes. Enhanced spatial and temporal resolution provides much better fit to the observed wine quality data. The study has been supported by the OTKA-113209 national project.