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Mapping the climatic terroir of a vineyard region in Austria.

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During a three-year period, starting in 2009, the vineyards of the Carnuntum region in eastern Austria have been investigated with respect to their “terroir” characteristics and dominating viticultural functions. The climatic terroir of the region was analysed in order to design high spatial resolution maps for support of vineyard management (including in view to adaptations to climate change). In the study area orography effects on plant stands, such as those induced by mountains or hills, including field slope and aspect, play an important role in modifying local climates compared with flat areas. Here, complex interactions such as the modification of the surface energy balance and the mass transfer of water related to wind direction and wind speed can change the local climatic conditions, including soil and air temperature, air humidity and evapotranspiration, which are critical for wine growth conditions, quality potential or pest and desease developement within vineyards. For example, the HUGLIN index (a growing degree day index for wine)was mapped including potential radiation frost risk areas showing considerable small scale variations (below 1 km distances) within the area. Other examples are maps of monthly extreme temperatures within the vineyard canopy and mean air humidity conditions over the terrain showing similar spatial variations, and depending strongly on orography.