



Portuguese wine regions under a changing climate

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Viticulture and wine production are among the most important sectors of the Portuguese economy. However, as grapevines are strongly affected by weather and climate, climate change may represent an important threat to wine production. The current (1950-2000) and future (2041-2070) bioclimatic conditions in Portugal are discussed by analyzing a number of indices suitable for viticultural zoning, including a categorized bioclimatic index. A two-step method of spatial pattern downscaling is applied in order to achieve a very high spatial resolution (of approximately 1 km) throughout Portugal. Future projections are based on an ensemble of 13 climate model transient experiments, forced by the SRES A1B emission scenario. Results for the recent past are in clear agreement with the current distribution of vineyards and of the established Denomination of Origin regions. Furthermore, the typical climatic conditions associated with each grapevine variety that are currently grown in Portugal are assessed. Under future scenarios, nevertheless, the current conditions are projected to change significantly towards a lower bioclimatic diversity. This can be explained by the projected warming and drying in future decades. The resulting changes in varietal suitability and wine characteristics of each region may thereby bring important challenges for the Portuguese winemaking sector. As such, new measures need to be timely implemented to adapt to these climate change projections and to mitigate their likely detrimental impacts on the Portuguese economy. Acknowledgments: this work is supported by European Union Funds (FEDER/COMPETE - Operational Competitiveness Programme) and by national funds (FCT - Portuguese Foundation for Science and Technology) under the project ClimVineSafe (PTDC/AGR-ALI/110877/2009).