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## Italian viticulture and climate change

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Italy is a world leader for viticulture and wine business. According to the 2021 National Wine Market Forum, promoted by National Wine Union (Uiv), the wine business in Italy is expected to have an annual turnover of 11 billion euros in 2022, keeping Italy at second place in the world trade market ranking.

Our study aims to understand the impact of climate change on wine production in Italy to provide useful information to winegrowers and stakeholders involved in the wine business to make their activities more sustainable and more resilient to climate change. The climate variables that most influence grape growth are: temperature, precipitation, and evapotranspiration. Starting from these variables, we calculate a range of bioclimatic indices, selected following the International Organisation of Vine and Wine Guidelines (OIV), to be correlated with grape yield data.

Using observations from the E-OBS gridded dataset, we investigate how the bioclimatic indices changed in the last 39 years (1980-2019), and the impact of these changes on grape productivity aggregated at the regional (NUTS2) scale. The Italian Statistic Institute (ISTAT) provides yearly grape yield data for each region, which allows us to account for specific regional grape characteristics and wine production policies.

Our results show low and not statistically significant correlations between individual bioclimatic indices and yields in most of the NUTS2 aggregations. Climate is not the only factor that influences wine productivity. In fact, vineyard management, policies, and markets can play a major role and those data are not included in the ISTAT dataset. The study highlights the need for higher quality data, including their metadata, and the active involvement of local businesses in this type of impact study.