■ Wine Quality Insights Report

Analyzed Regions: Heraklion — N/A region, notable for N/A.
Date Range: 2024–2028

■ Model Performance Metrics

• R^2 Score: 0.893
• RMSE: 0.295
• MAE: 0.182

■ Summary of Key Drivers

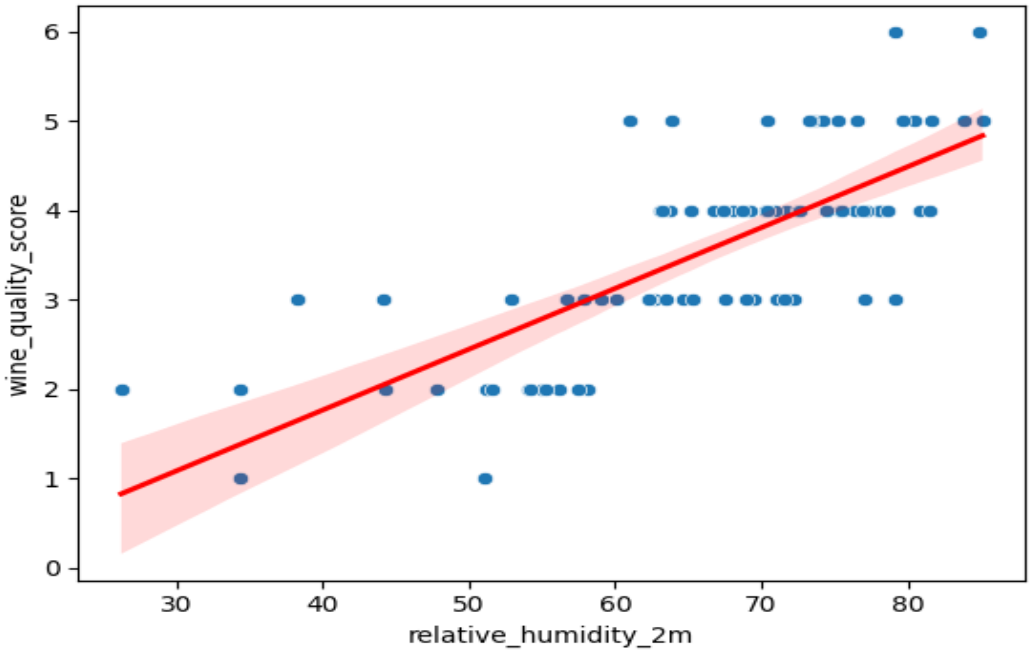
Key climate indicators influencing wine quality include:
• Relative Humidity 2M (Percentage of moisture in air compared to max capacity) — positively correlated (r = 0.757)
• Et0 Fao Evapotranspiration X (N/A) — negatively correlated (r = -0.728)
• Et0 Fao Evapotranspiration (FAO Penman-Monteith evapotranspiration estimate) — negatively correlated (r = -0.728)

■ Top Correlated Features (r ≥ 0.5)

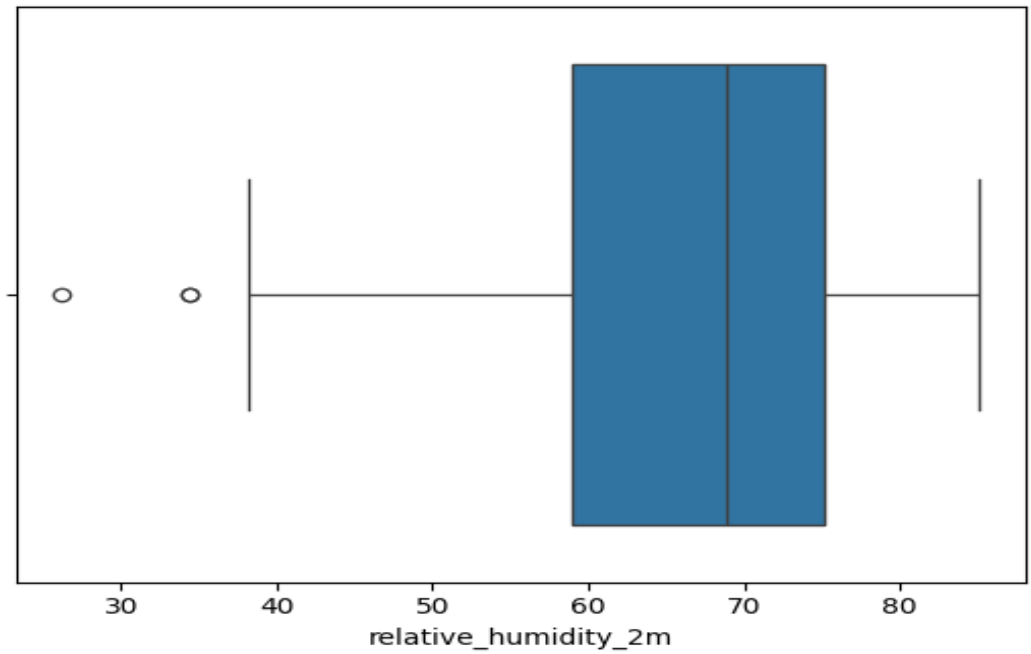
Feature	Correlation	Description
relative_humidity_2m	0.7574487566378442	Percentage of moisture in air compared to max capacity
et0_fao_evapotranspiration_x	-0.7278138691253382	N/A
et0_fao_evapotranspiration	-0.7278138691253382	FAO Penman-Monteith evapotranspiration estimate
et0_fao_evapotranspiration_x_rollmean7	-0.7253235031457375	N/A
et0_fao_evapotranspiration_x_rollmean3	-0.7253235031457375	N/A
dew_point_2m	0.674317253859815	Temperature at which air reaches saturation (humidity marker)
relative_humidity_2m_rollmean7	0.6683330237990494	N/A
wind_speed_10m	-0.6543965069294109	Horizontal wind speed at 10 meters
et0_fao_evapotranspiration_y_rollmean7	-0.6467849248203646	N/A
dew_point_2m_rollmean3	0.6453335075702336	N/A
relative_humidity_2m_rollmean3	0.6441897819112462	N/A
dew_point_2m_lag1	0.6405990889348082	N/A
relative_humidity_2m_lag1	0.6399471184470871	N/A
et0_fao_evapotranspiration_y_rollmean3	-0.6341564192911083	N/A
et0_fao_evapotranspiration_y_lag1	-0.633552020204887	N/A
dew_point_2m_rollmean7	0.6325929796365949	N/A
wind_gusts_10m_lag1	-0.6265625398981739	N/A
wind_gusts_10m_rollmean3	-0.6250078043928715	N/A
wind_gusts_10m_rollmean7	-0.6195435200073575	N/A

wind_gusts_10m_lag7	-0.613340409393595	N/A

■ Correlation Scatter Plot



■ KPI Box Plot



■ 4. Methodology

This report analyzes the correlation between meteorological variables and wine quality using Pearson correlation (r). Features with |r| ≥ 0.5 are considered significant. Scatter and box plots visualize relationships with the target variable.

■ 5. References

• Baltzakis, T., 'Wine Quality Forecasting under Climate Variability', 2024
• scikit-learn documentation
• XGBoost documentation
• ReportLab documentation

■ Streamlit Dashboard Access

https://your-streamlit-app

■■■ Report generated by Baltzakis Themistoklis

■ Date: 2025-04-22