Supplement

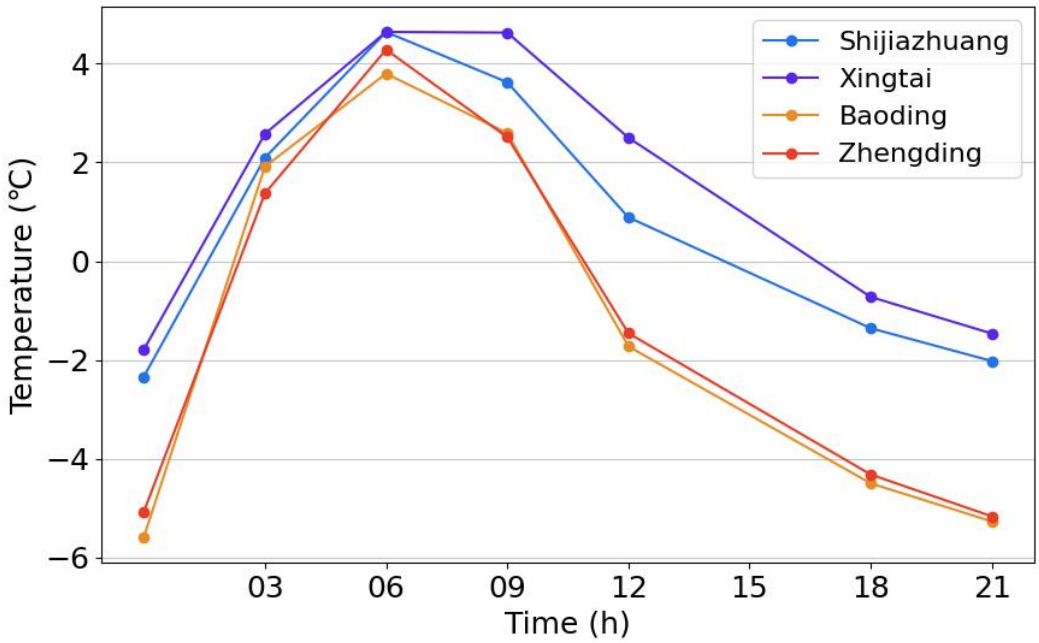

Figure S1: Winter daily-hour average comparison of 2m temperature among the leeward stations.

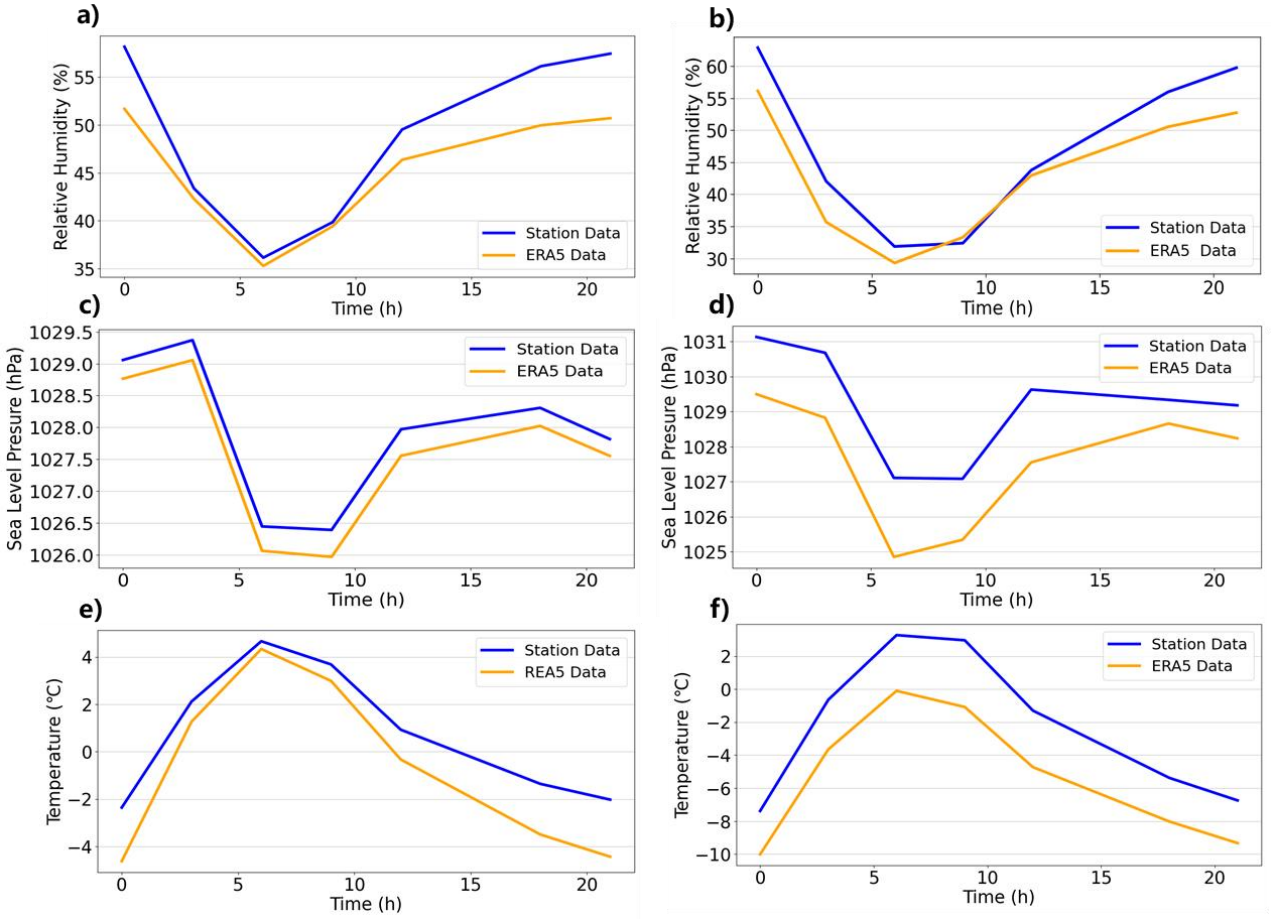

Figure S2: Winter daily-hour average comparison of station data and ERA5 data. (a-b) Ground relative humidity. (c-d) Sea level pressure. (e-f) 2m temperature. The left column shows data for Shijiazhuang, and the right is for Taiyuan.

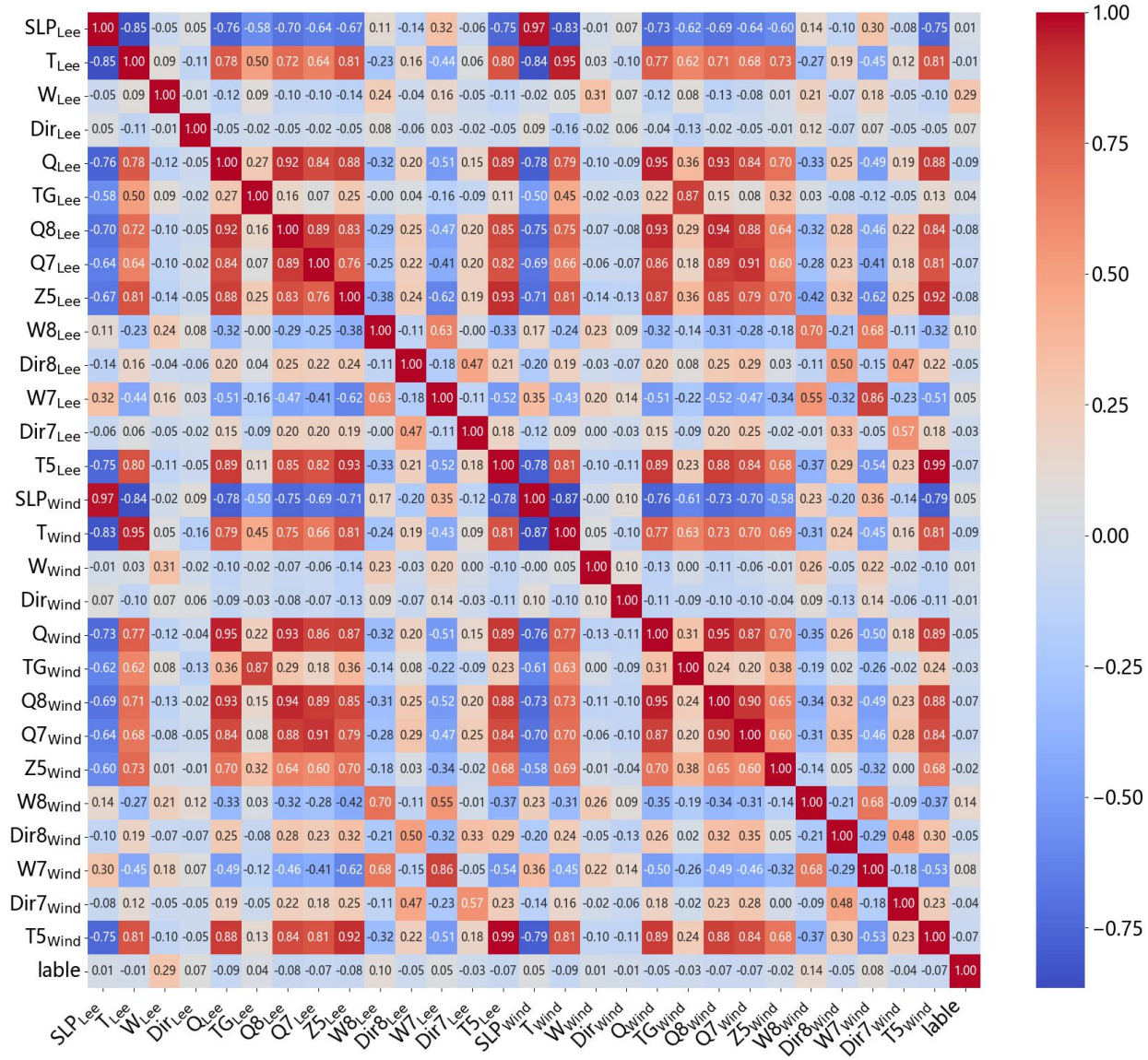

Figure S3: The Pearson correlation coefficient matrix of each factor.

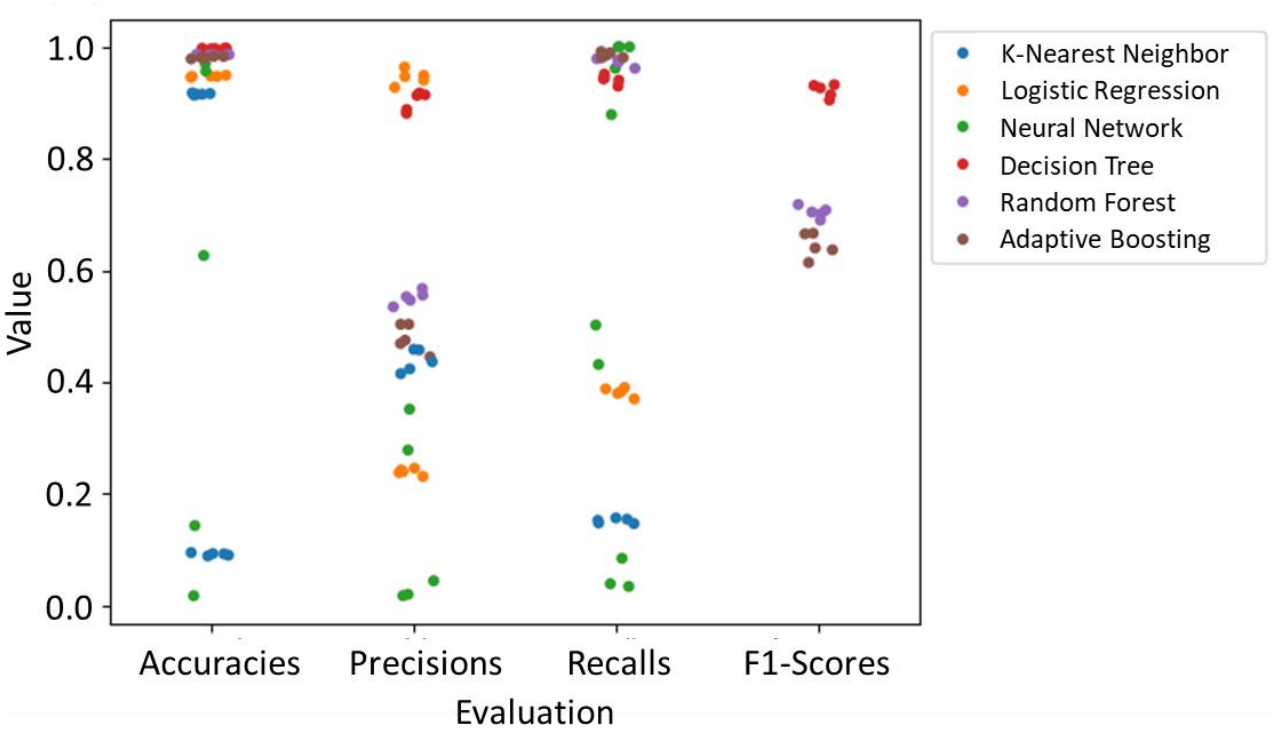

Figure S4: Scatter plots of each model's evaluation indicators. Each dot represents the result of one training session in k-fold cross-validation, and different colors represent different models.

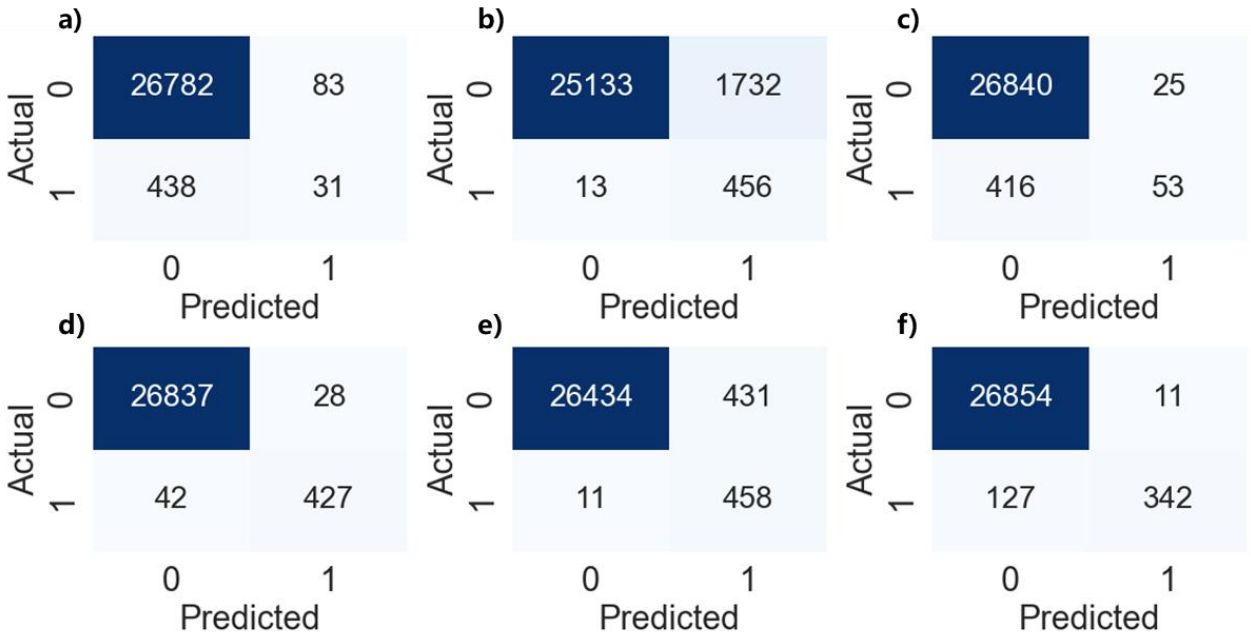

Figure S5: The confusion matrices of each model. (a-f) are K-Nearest Neighbor, Logistic Regression, Neural Network, Decision Tree, Random Forest and Adaptive Boosting respectively.

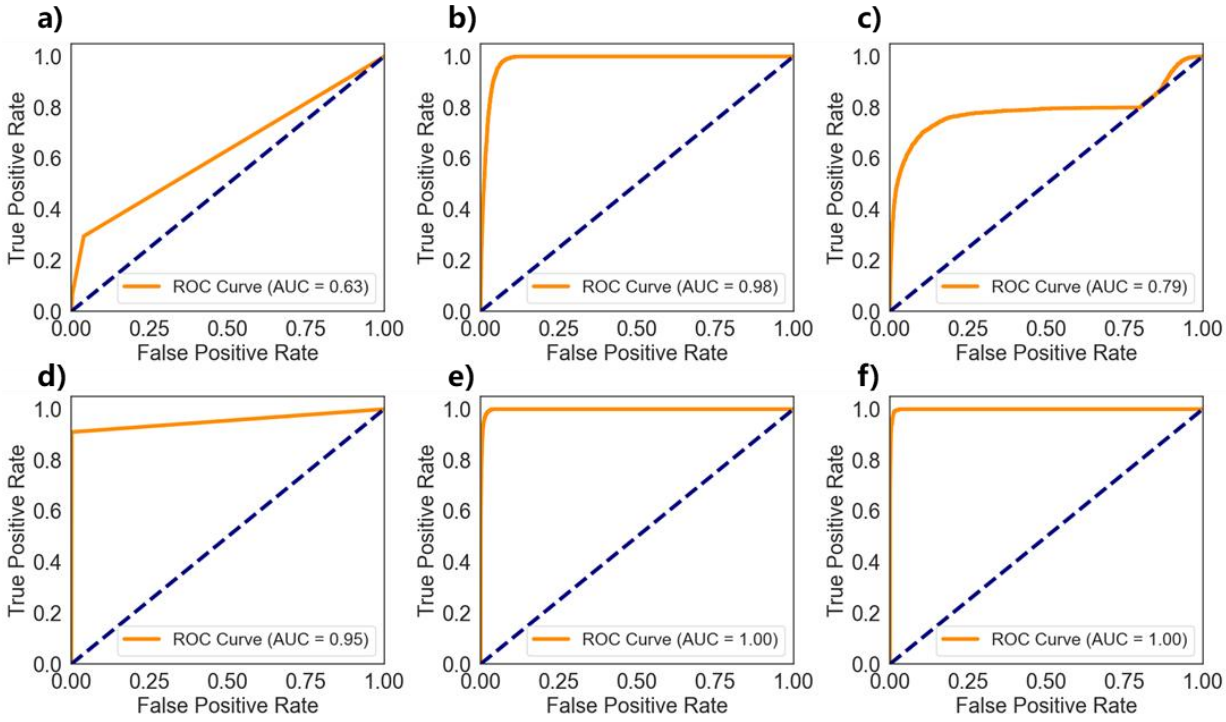

Figure S6: The ROC curves and AUC of each model. (a-f) are K-Nearest Neighbor, Logistic Regression, Neural Network, Decision Tree, Random Forest and Adaptive Boosting respectively.

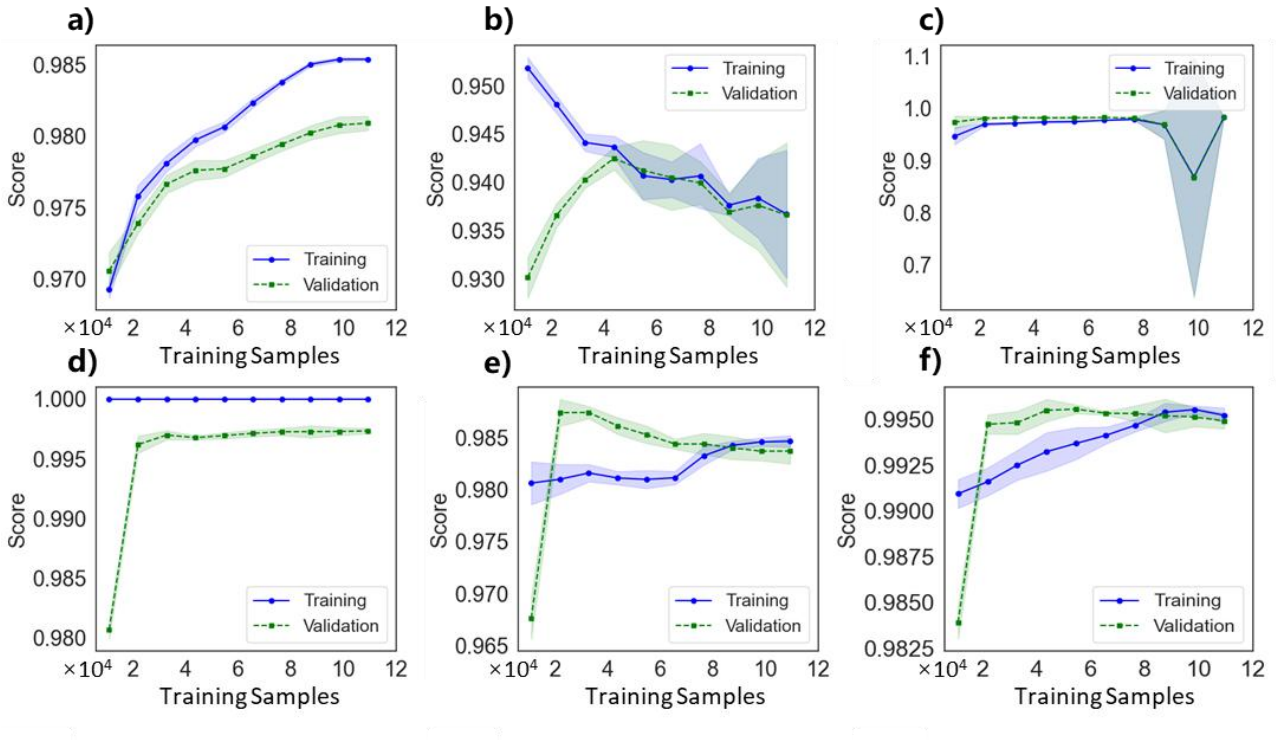

Figure S7: The learning curves of each model. (a-f) are K-Nearest Neighbor, Logistic Regression, Neural Network, Decision Tree, Random Forest and Adaptive Boosting respectively.

Table S1: The threshold values and contributions of factors during the occurrence of foehn on the eastern foothills of the Taihang Mountains.

Factors	All year	Winter	Summer	Contribution
W_{Lee}		＞3 m/s		Winter>Summer
T_{Wind}	<3℃	<-6℃	<9℃	Winter<Summer
T_{Lee}	\	\	\	Mainly based on the windward station.
Q_{Wind}	>0.1g/kg	>0.07g/kg	>0.75g/kg	(It mainly has an inhibitory effect, and the inhibitory effect is not significant after reaching the threshold.) Winter>Summer
Q_{Lee}	\	\	\	Mainly based on the windward station.
Dir_{Lee}	203°-324° (41%), where 237°-294° contributes most.			\