

Supplementary Figures

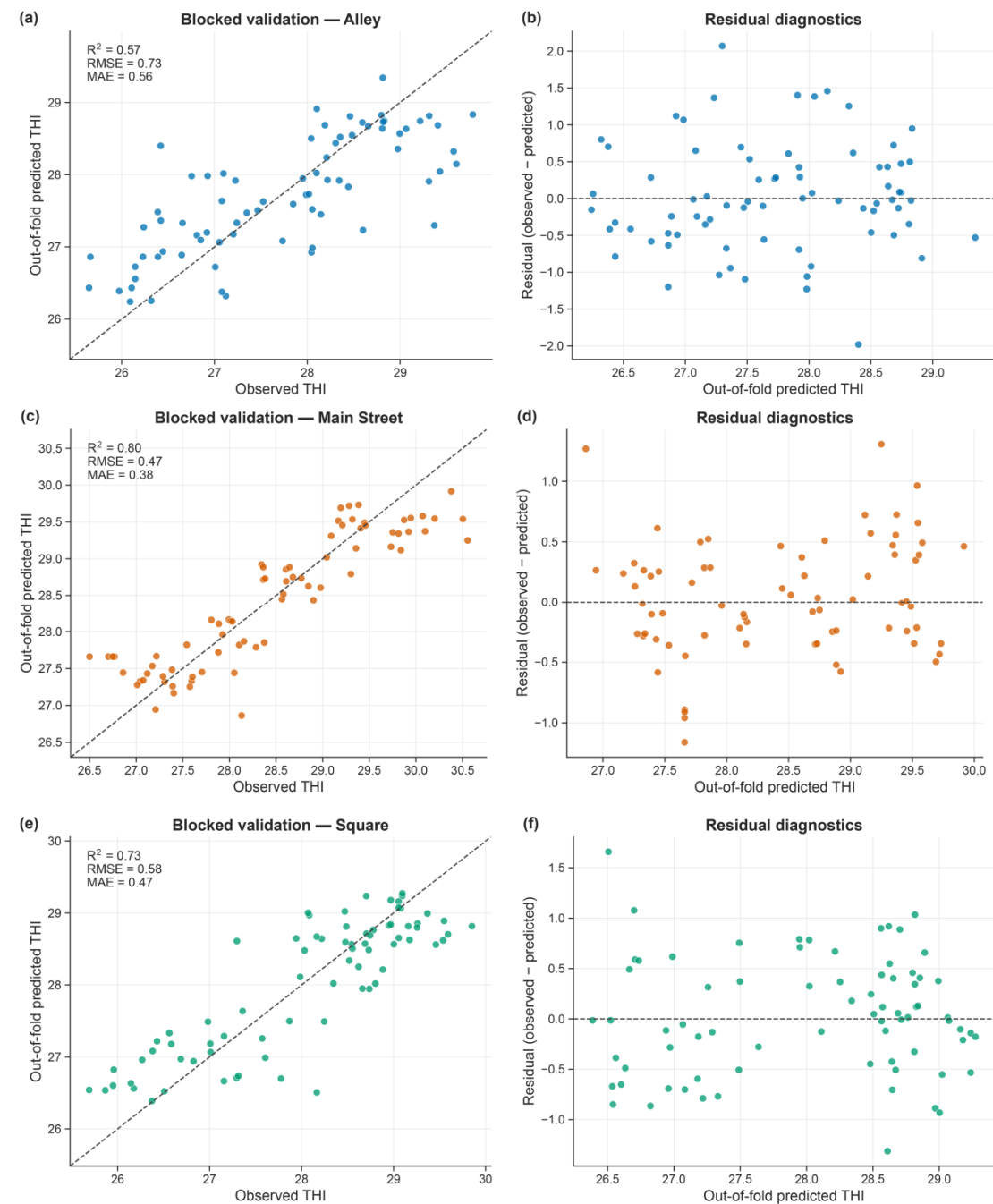


Figure S1. Grouped block cross-validation performance and residual diagnostics of XGBoost models across three analytical scenarios. Observed versus out-of-fold predicted THI and corresponding residual diagnostics for (a,b) the reconstructed Alley scenario, (c,d) Main Street, and (e,f) Square. Dashed lines in panels (a), (c), and (e) represent the 1:1 relationship; dashed horizontal lines in panels (b), (d), and (f) indicate zero residual. R^2 , RMSE, and MAE were calculated from grouped out-of-fold predictions.