富久町 - オキシダント予測の分析

Model Parameters:
Prefecture code: 38
Station code: 38201020
Station name: 富久町
Target item: Ox(ppm)
Number of data points in the train set: 13328
Number of data points in the test set: 5712
Forecast horizon (hours): 24
Model: LightGBM
Objective: regression
Boosting type: gbdt
Number of estimators: 400
Learning rate: 0.04
Elapsed time: 0 min 42 sec
Number of used features: 140

Features:
 NO(ppm), NO2(ppm), U, V, Ox(ppm)_lag1
 Ox(ppm)_lag2, Ox(ppm)_lag3, Ox(ppm)_lag4, Ox(ppm)_lag5, Ox(ppm)_lag6
 Ox(ppm)_lag7, Ox(ppm)_lag8, Ox(ppm)_lag9, Ox(ppm)_lag10, Ox(ppm)_lag11
 Ox(ppm)_lag12, Ox(ppm)_lag13, Ox(ppm)_lag14, Ox(ppm)_lag15, Ox(ppm)_lag16
 Ox(ppm)_lag17, Ox(ppm)_lag18, Ox(ppm)_lag19, Ox(ppm)_lag20, Ox(ppm)_lag21
 Ox(ppm)_lag22, Ox(ppm)_lag23, NO(ppm)_lag1, NO(ppm)_lag2, NO(ppm)_lag3
 NO(ppm)_lag4, NO(ppm)_lag5, NO(ppm)_lag6, NO(ppm)_lag7, NO(ppm)_lag8
 NO(ppm)_lag9, NO(ppm)_lag10, NO(ppm)_lag11, NO(ppm)_lag12, NO(ppm)_lag13
 NO(ppm)_lag14, NO(ppm)_lag15, NO(ppm)_lag16, NO(ppm)_lag17, NO(ppm)_lag18
 NO(ppm)_lag19, NO(ppm)_lag20, NO(ppm)_lag21, NO(ppm)_lag22, NO(ppm)_lag23
 NO2(ppm)_lag1, NO2(ppm)_lag2, NO2(ppm)_lag3, NO2(ppm)_lag4, NO2(ppm)_lag5
 NO2(ppm)_lag6, NO2(ppm)_lag7, NO2(ppm)_lag8, NO2(ppm)_lag9, NO2(ppm)_lag10
 NO2(ppm)_lag11, NO2(ppm)_lag12, NO2(ppm)_lag13, NO2(ppm)_lag14, NO2(ppm)_lag15
 NO2(ppm)_lag16, NO2(ppm)_lag17, NO2(ppm)_lag18, NO2(ppm)_lag19, NO2(ppm)_lag20
 NO2(ppm)_lag21, NO2(ppm)_lag22, NO2(ppm)_lag23, U_lag1, U_lag2
 U_lag3, U_lag4, U_lag5, U_lag6, U_lag7
 U_lag8, U_lag9, U_lag10, U_lag11, U_lag12
 U_lag13, U_lag14, U_lag15, U_lag16, U_lag17
 U_lag18, U_lag19, U_lag20, U_lag21, U_lag22
 U_lag23, V_lag1, V_lag2, V_lag3, V_lag4
 V_lag5, V_lag6, V_lag7, V_lag8, V_lag9
 V_lag10, V_lag11, V_lag12, V_lag13, V_lag14
 V_lag15, V_lag16, V_lag17, V_lag18, V_lag19
 V_lag20, V_lag21, V_lag22, V_lag23, Ox(ppm)_roll_mean_3
 Ox(ppm)_roll_std_6, NO(ppm)_roll_mean_3, NO(ppm)_roll_std_6, NO2(ppm)_roll_mean_3, NO2(ppm)_roll_std_6
 U_roll_mean_3, U_roll_std_6, V_roll_mean_3, V_roll_std_6, Ox(ppm)_diff_1
 Ox(ppm)_diff_2, Ox(ppm)_diff_3, NO(ppm)_diff_3, NO2(ppm)_diff_3, U_diff_3
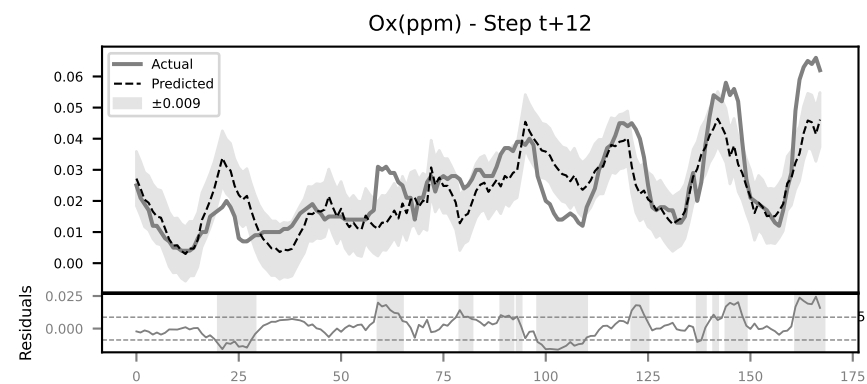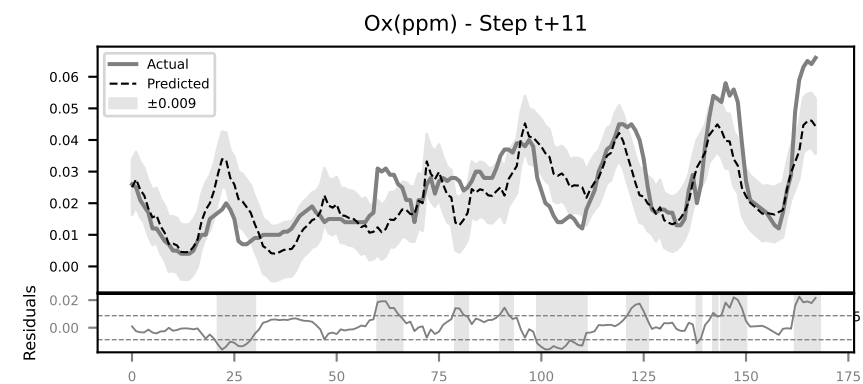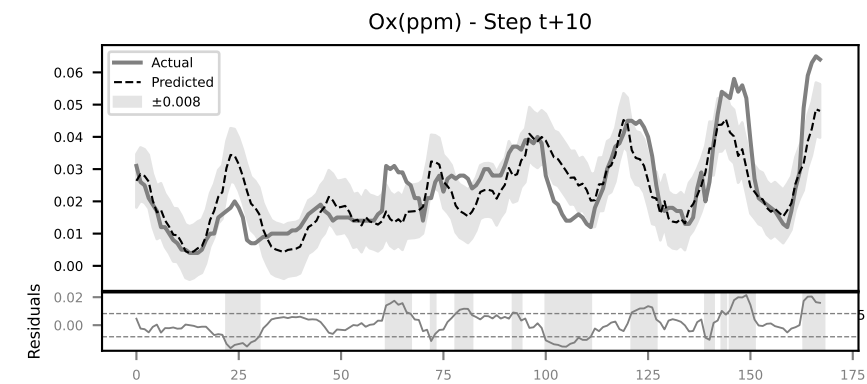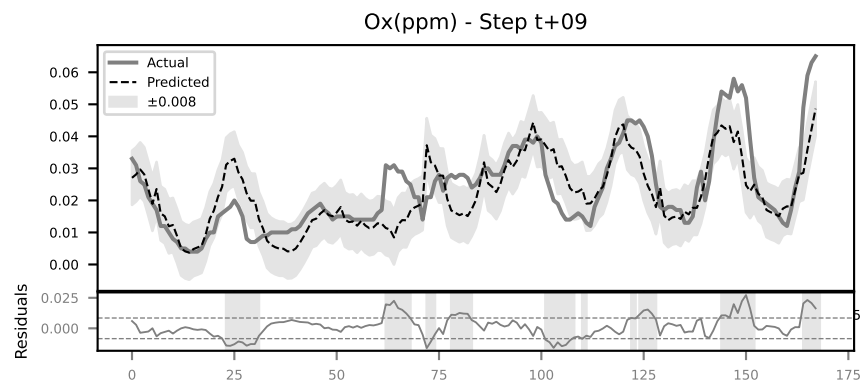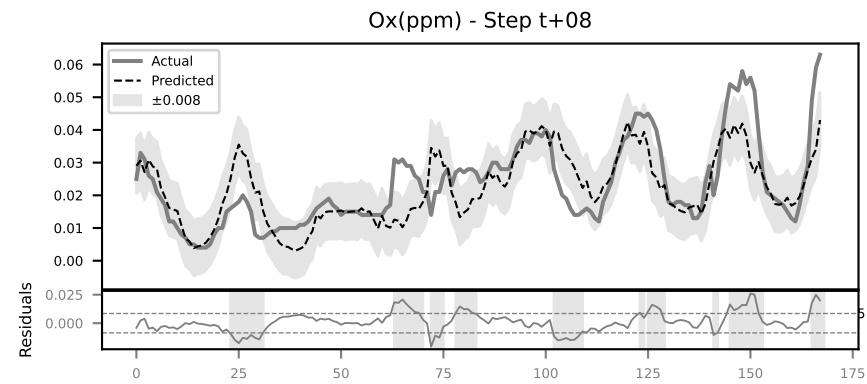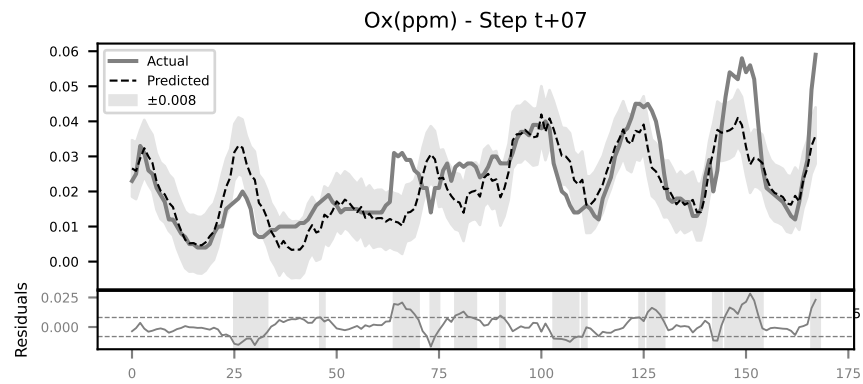 V_diff_3, hour_sin, hour_cos, dayofweek, is_weekend

Metrics per Forecast Step:
Ox(ppm)_t+01 - R²: 0.8557, MAE: 0.0035, RMSE: 0.0050
Ox(ppm)_t+02 - R²: 0.7768, MAE: 0.0045, RMSE: 0.0062
Ox(ppm)_t+03 - R²: 0.7157, MAE: 0.0052, RMSE: 0.0070
Ox(ppm)_t+04 - R²: 0.6571, MAE: 0.0057, RMSE: 0.0076
Ox(ppm)_t+05 - R²: 0.6066, MAE: 0.0062, RMSE: 0.0082
Ox(ppm)_t+06 - R²: 0.5602, MAE: 0.0065, RMSE: 0.0087
Ox(ppm)_t+07 - R²: 0.5193, MAE: 0.0069, RMSE: 0.0091
Ox(ppm)_t+08 - R²: 0.4879, MAE: 0.0071, RMSE: 0.0093
Ox(ppm)_t+09 - R²: 0.4586, MAE: 0.0073, RMSE: 0.0096
Ox(ppm)_t+10 - R²: 0.4419, MAE: 0.0075, RMSE: 0.0098
Ox(ppm)_t+11 - R²: 0.4201, MAE: 0.0076, RMSE: 0.0099
Ox(ppm)_t+12 - R²: 0.4014, MAE: 0.0077, RMSE: 0.0101
Ox(ppm)_t+13 - R²: 0.3865, MAE: 0.0079, RMSE: 0.0102
Ox(ppm)_t+14 - R²: 0.3759, MAE: 0.0079, RMSE: 0.0103
Ox(ppm)_t+15 - R²: 0.3691, MAE: 0.0080, RMSE: 0.0104
Ox(ppm)_t+16 - R²: 0.3600, MAE: 0.0080, RMSE: 0.0105
Ox(ppm)_t+17 - R²: 0.3640, MAE: 0.0080, RMSE: 0.0104
Ox(ppm)_t+18 - R²: 0.3583, MAE: 0.0081, RMSE: 0.0105
Ox(ppm)_t+19 - R²: 0.3566, MAE: 0.0081, RMSE: 0.0105
Ox(ppm)_t+20 - R²: 0.3549, MAE: 0.0081, RMSE: 0.0105
Ox(ppm)_t+21 - R²: 0.3487, MAE: 0.0081, RMSE: 0.0105
Ox(ppm)_t+22 - R²: 0.3423, MAE: 0.0082, RMSE: 0.0106
Ox(ppm)_t+23 - R²: 0.3468, MAE: 0.0081, RMSE: 0.0105
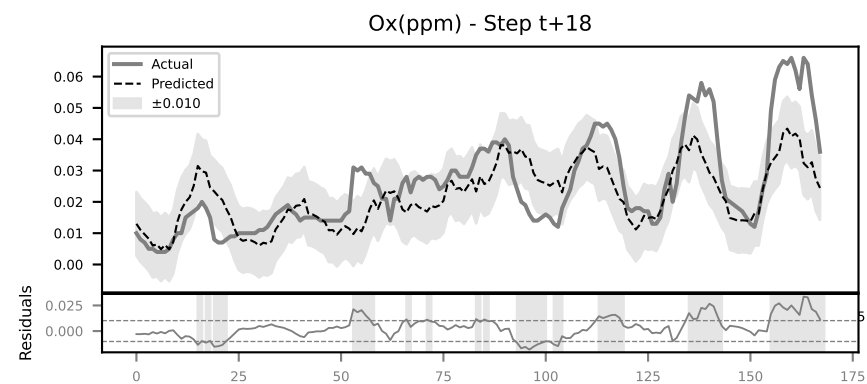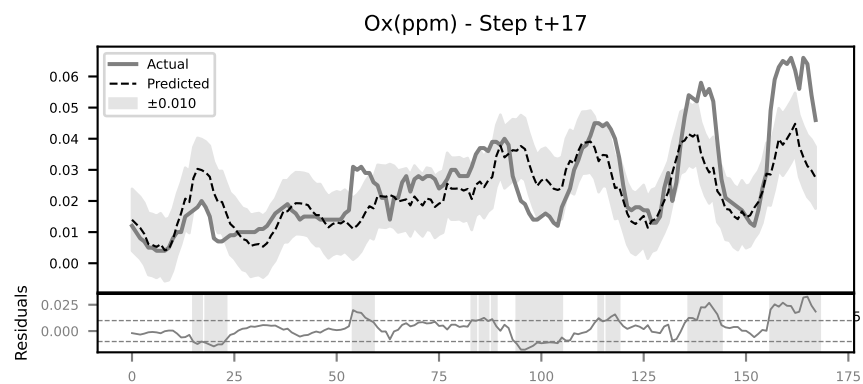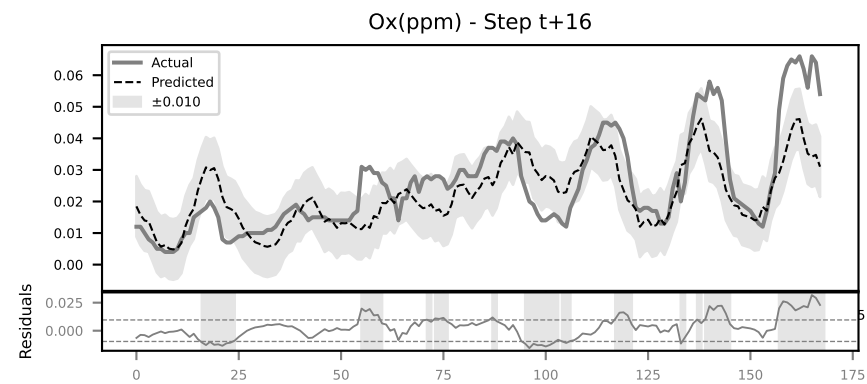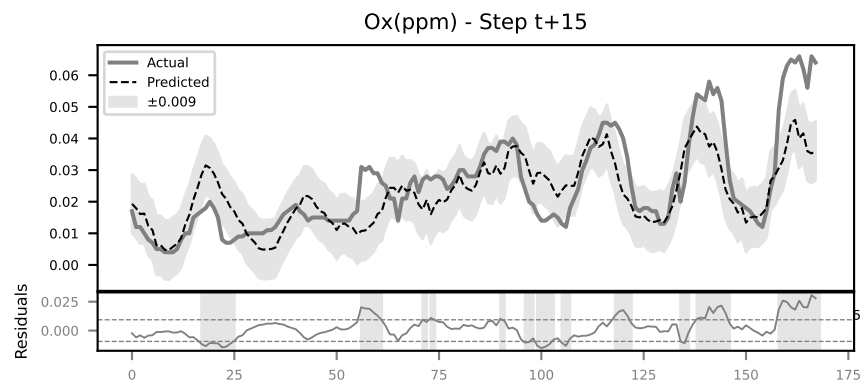Ox(ppm)_t+24 - R²: 0.3405, MAE: 0.0082, RMSE: 0.0106

Comparison between actual and predicted values
with ± Standard Deviation Bands
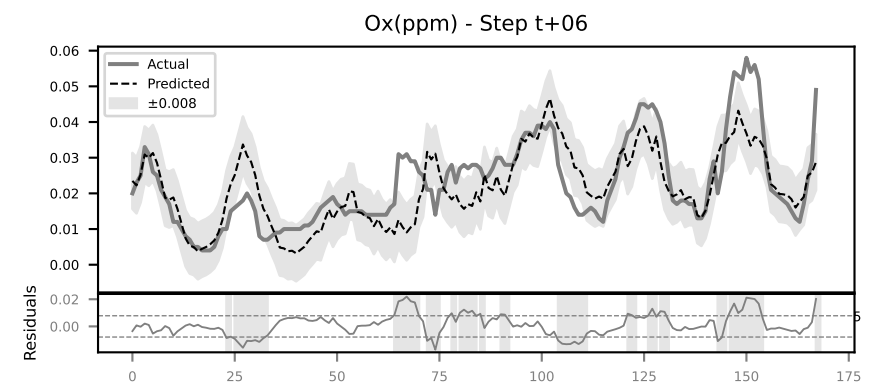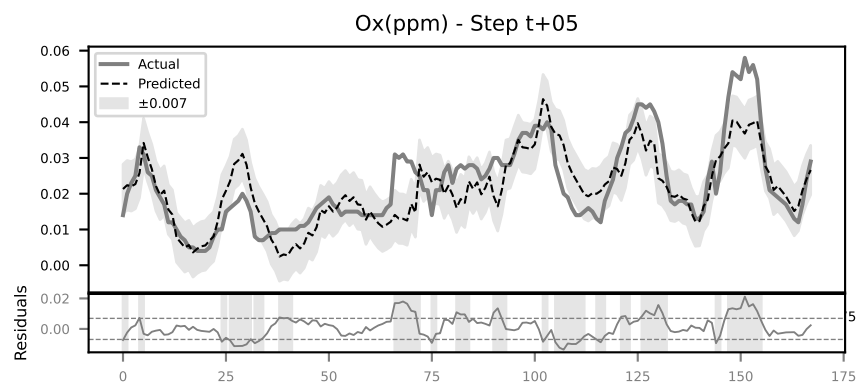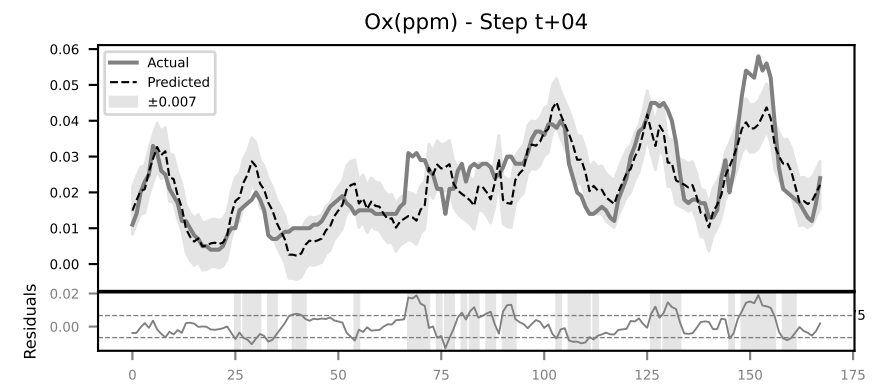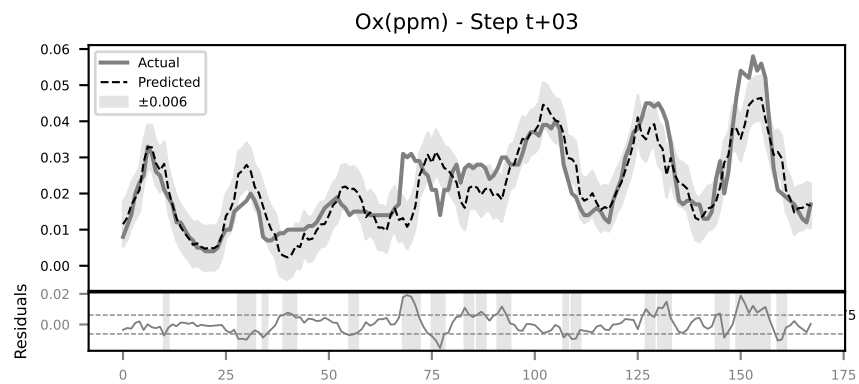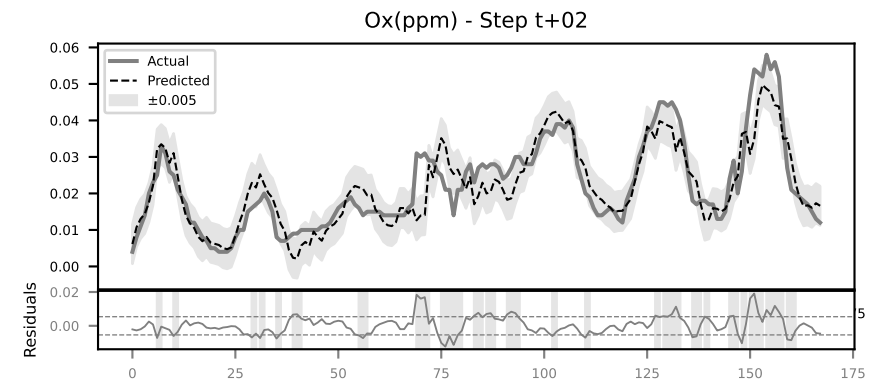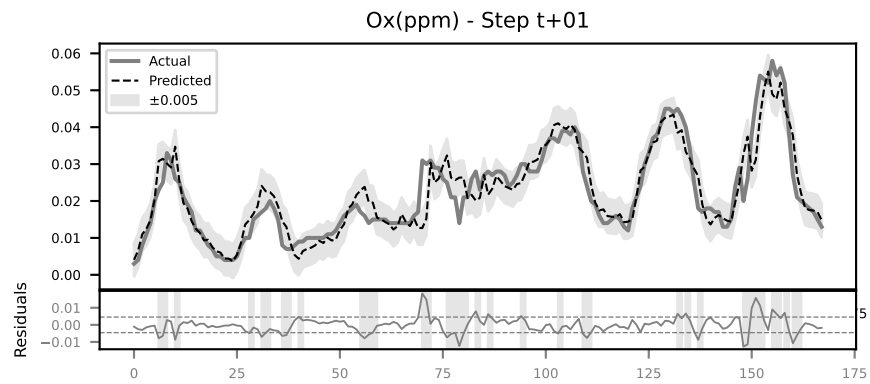
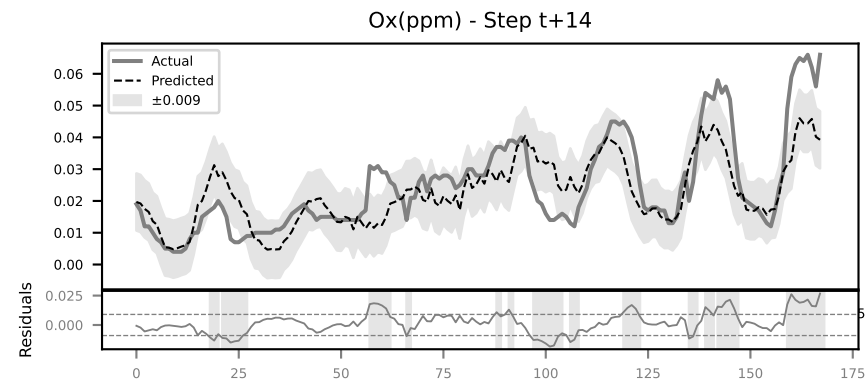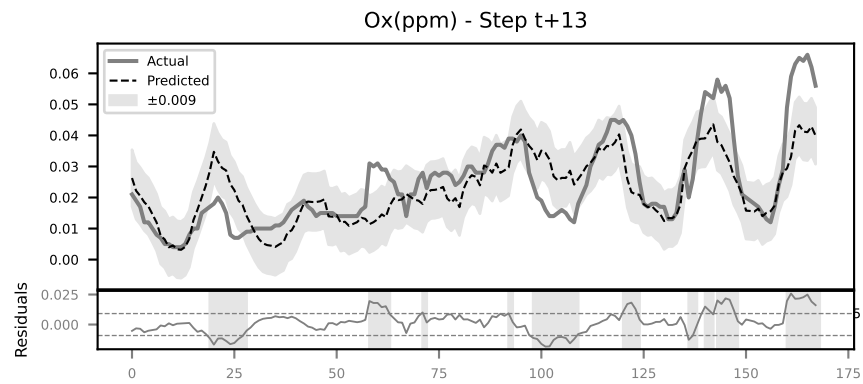Comparison between actual and predicted values
with ± Standard Deviation Bands

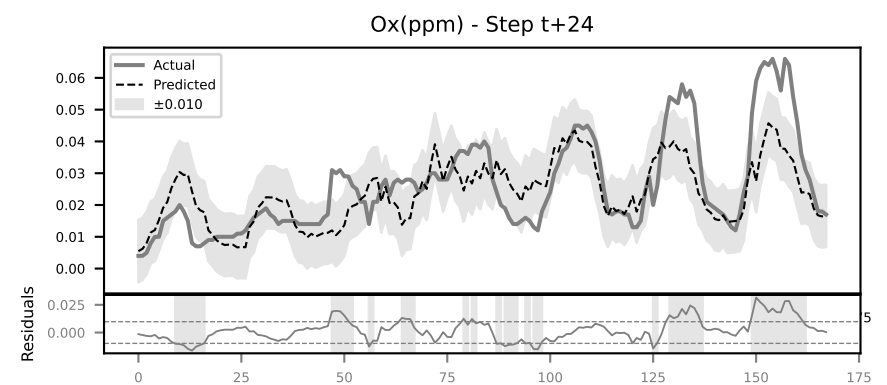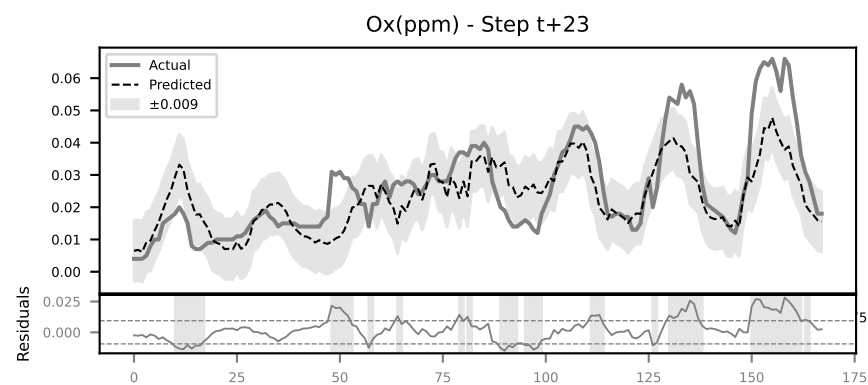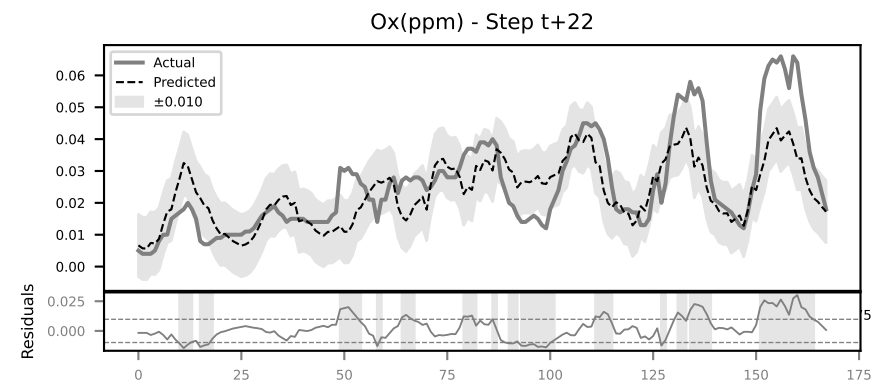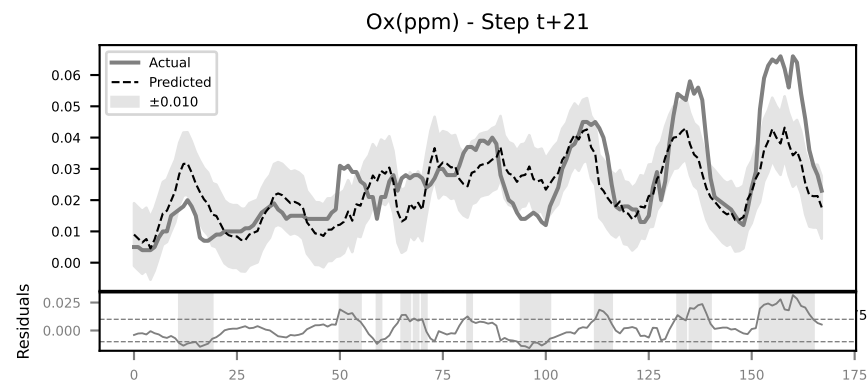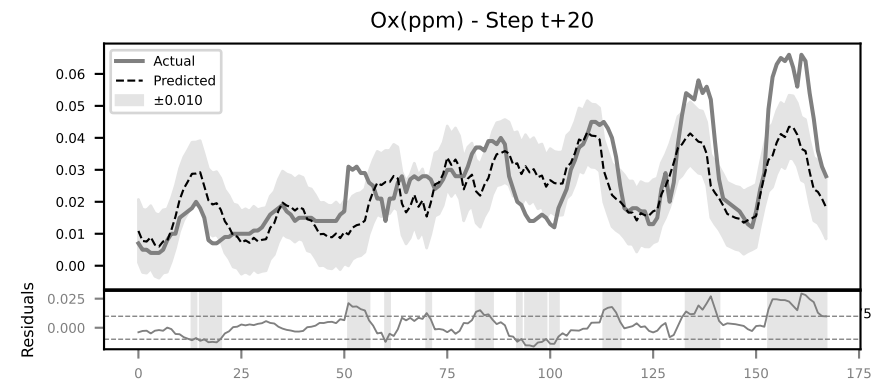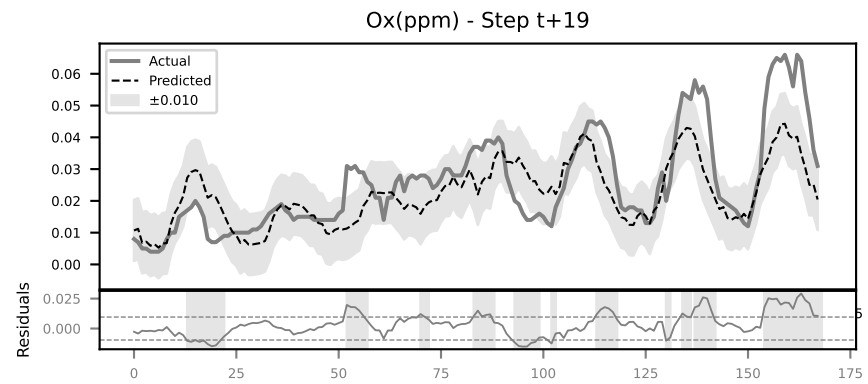# Comparison between actual and predicted values
with ± Standard Deviation Bands

Ox(ppm) - Step t+13

Ox(ppm) - Step t+14

Ox(ppm) - Step t+15

Ox(ppm) - Step t+16

Ox(ppm) - Step t+17

Ox(ppm) - Step t+18

Comparison between actual and predicted values
with ± Standard Deviation Bands

MAE, RMSE, and R² for each Forecast Step

Normalized Feature Importance (per feature)

Normalized Feature Importance (per step)