



Supplement of

Development and evaluation of correction models for a low-cost fine particulate matter monitor

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Results from Excluded Models

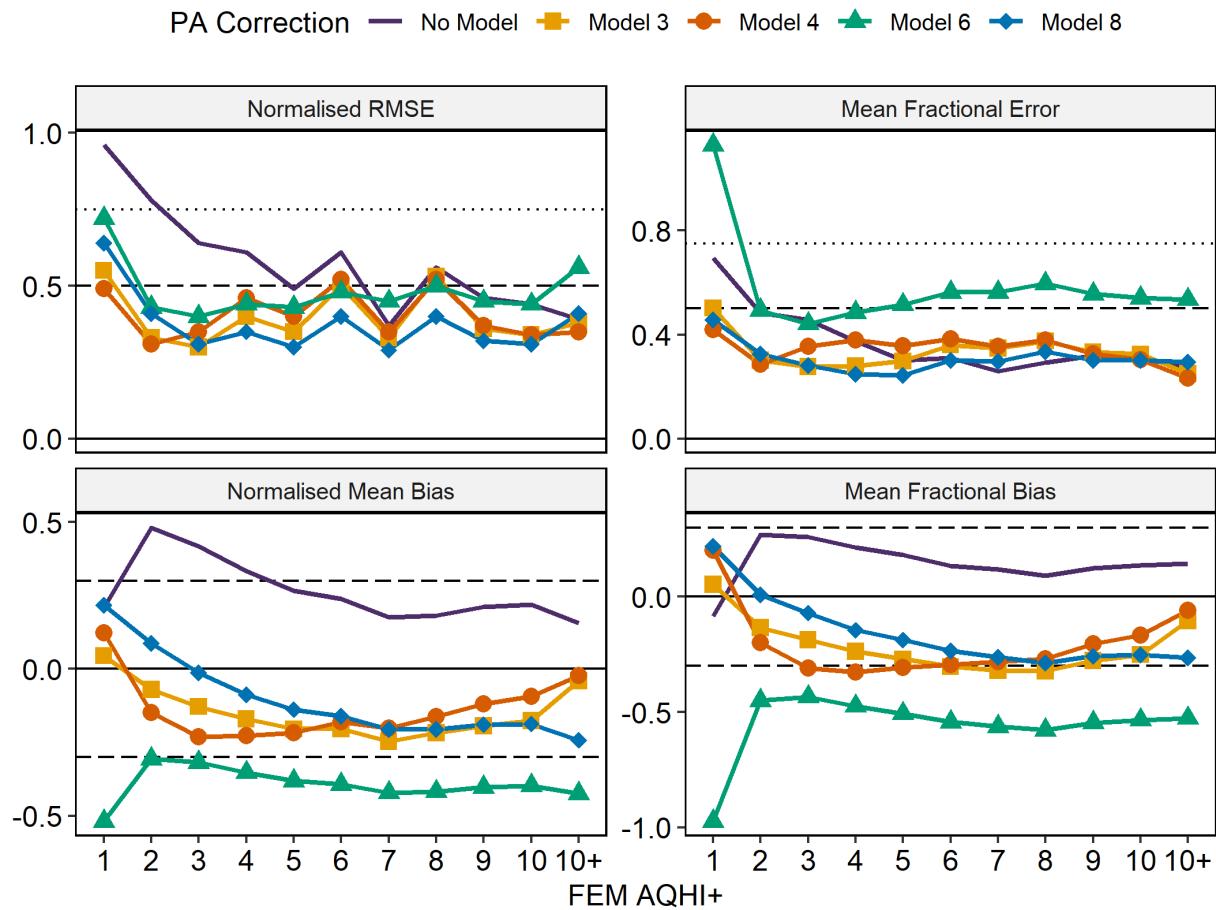


Figure S1. Comparison statistics across Federal Equivalent Method (FEM) AQHI+ levels for the excluded correction models. Goal and acceptable levels are displayed where possible for RMSE (0.75 & 0.5), MFE (0.75 & 0.5), NMB (± 0.3 & ± 0.6) and MFB (± 0.3 & ± 0.6).

Table S1. PurpleAir (PA) normalised mean bias (NMB), normalised root mean square error (NRMSE), mean fractional error (MFE) and mean fractional bias (MFB) at low/moderate/high/very high Federal Equivalent Method (FEM) AQHI+ levels for each excluded PA correction model. A crude score is calculated by averaging each statistics integer rank (from 1 to 5) for the models within that AQHI+ group. The top performing models are highlighted.

| FEM AQHI+ | Model | NMB | NRMSE | MFE | MFB | Score |
|-----------------|----------|-------|-------|------|-------|-------|
| Low [1-3] | No Model | 0.33 | 0.96 | 0.65 | -0.01 | 3.5 |
| | Model 3 | -0.01 | 0.48 | 0.46 | 0.01 | 2.3 |
| | Model 4 | -0.01 | 0.46 | 0.39 | 0.12 | 1.5 |
| | Model 6 | -0.42 | 0.63 | 1.00 | -0.87 | 4.8 |
| | Model 8 | 0.15 | 0.55 | 0.43 | 0.17 | 3.0 |
| Moderate [4-6] | No Model | 0.30 | 0.59 | 0.35 | 0.20 | 3.5 |
| | Model 3 | -0.19 | 0.42 | 0.30 | -0.25 | 2.3 |
| | Model 4 | -0.22 | 0.46 | 0.37 | -0.32 | 3.6 |
| | Model 6 | -0.37 | 0.46 | 0.50 | -0.49 | 4.6 |
| | Model 8 | -0.12 | 0.35 | 0.25 | -0.17 | 1.0 |
| High [7-9] | No Model | 0.19 | 0.47 | 0.28 | 0.11 | 2.1 |
| | Model 3 | -0.22 | 0.41 | 0.35 | -0.31 | 3.4 |
| | Model 4 | -0.17 | 0.41 | 0.36 | -0.26 | 2.4 |
| | Model 6 | -0.42 | 0.47 | 0.57 | -0.56 | 4.9 |
| | Model 8 | -0.20 | 0.34 | 0.31 | -0.27 | 2.3 |
| Very High [10+] | No Model | 0.16 | 0.39 | 0.28 | 0.14 | 2.9 |
| | Model 3 | -0.05 | 0.39 | 0.26 | -0.12 | 2.1 |
| | Model 4 | -0.03 | 0.35 | 0.24 | -0.07 | 1.0 |
| | Model 6 | -0.42 | 0.56 | 0.54 | -0.53 | 5.0 |
| | Model 8 | -0.24 | 0.42 | 0.30 | -0.26 | 4.0 |

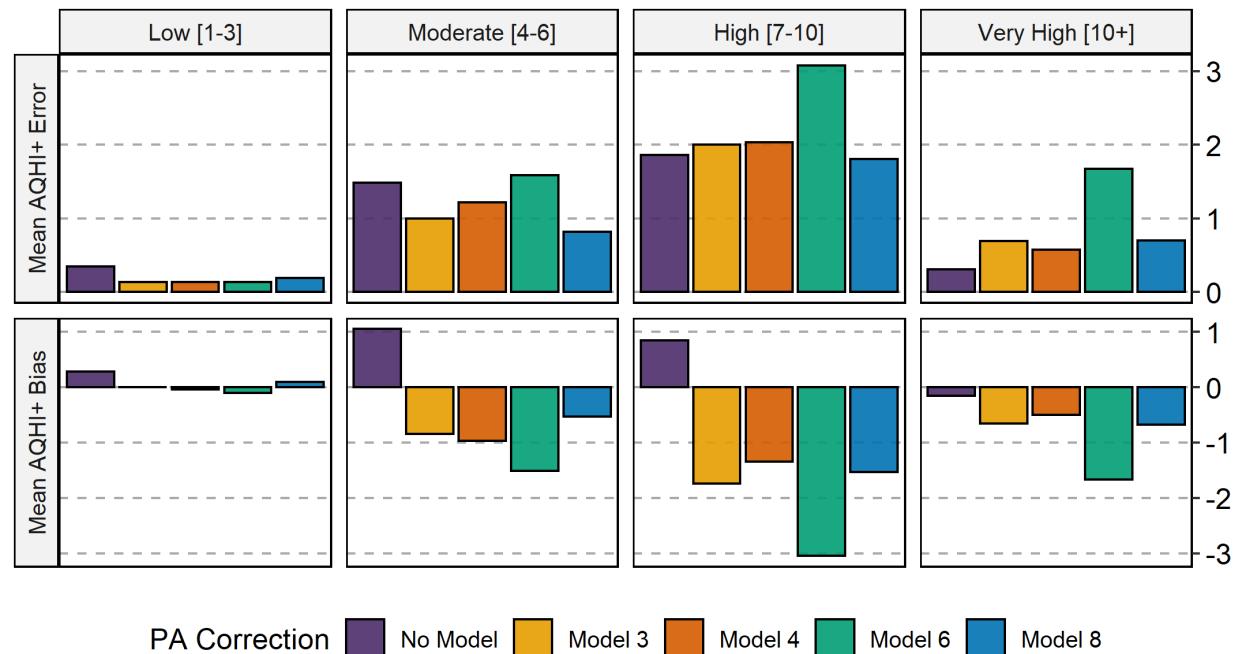


Figure S2. Mean PurpleAir (PA) AQHI+ error and bias for low/moderate/high/very high Federal Equivalent Method (FEM) AQHI+ levels for excluded correction models.

Rationale for [30%,70%] RH Truncation

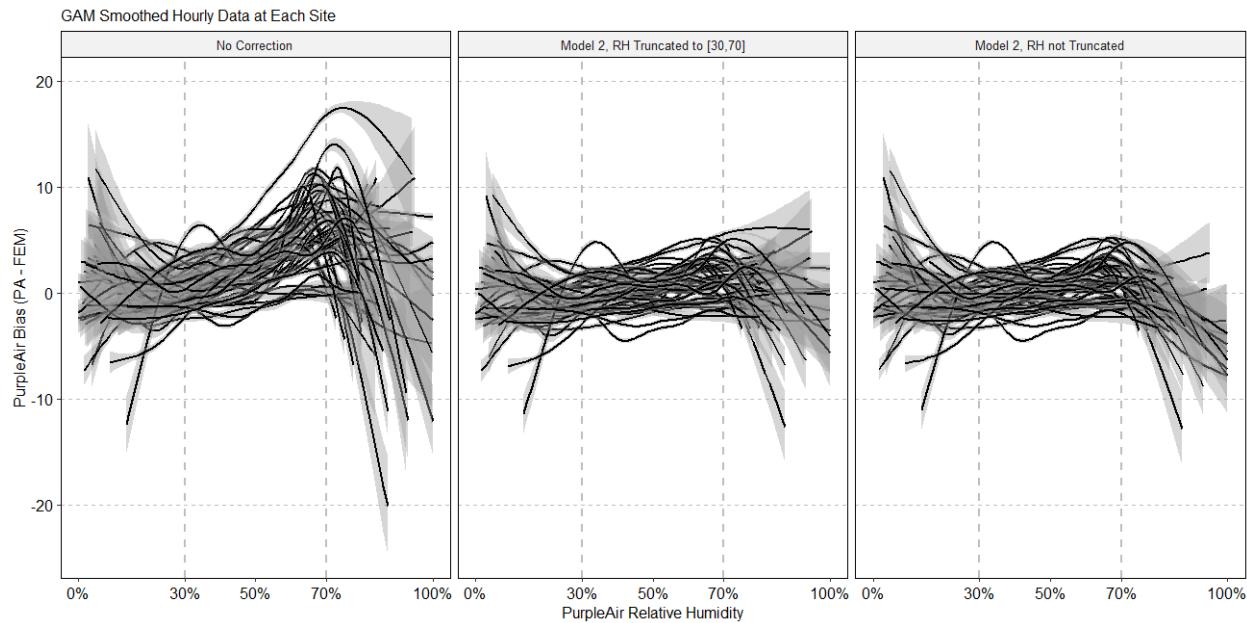


Figure S3. General additive models for each colocation site showing hourly PurpleAir – FEM bias as a function of RH for uncorrected, corrected and truncated, and corrected but not truncated PurpleAir data. Note the increase in variability within the bias outside of [30%, 70%] RH.

Individual Testing Site Performance

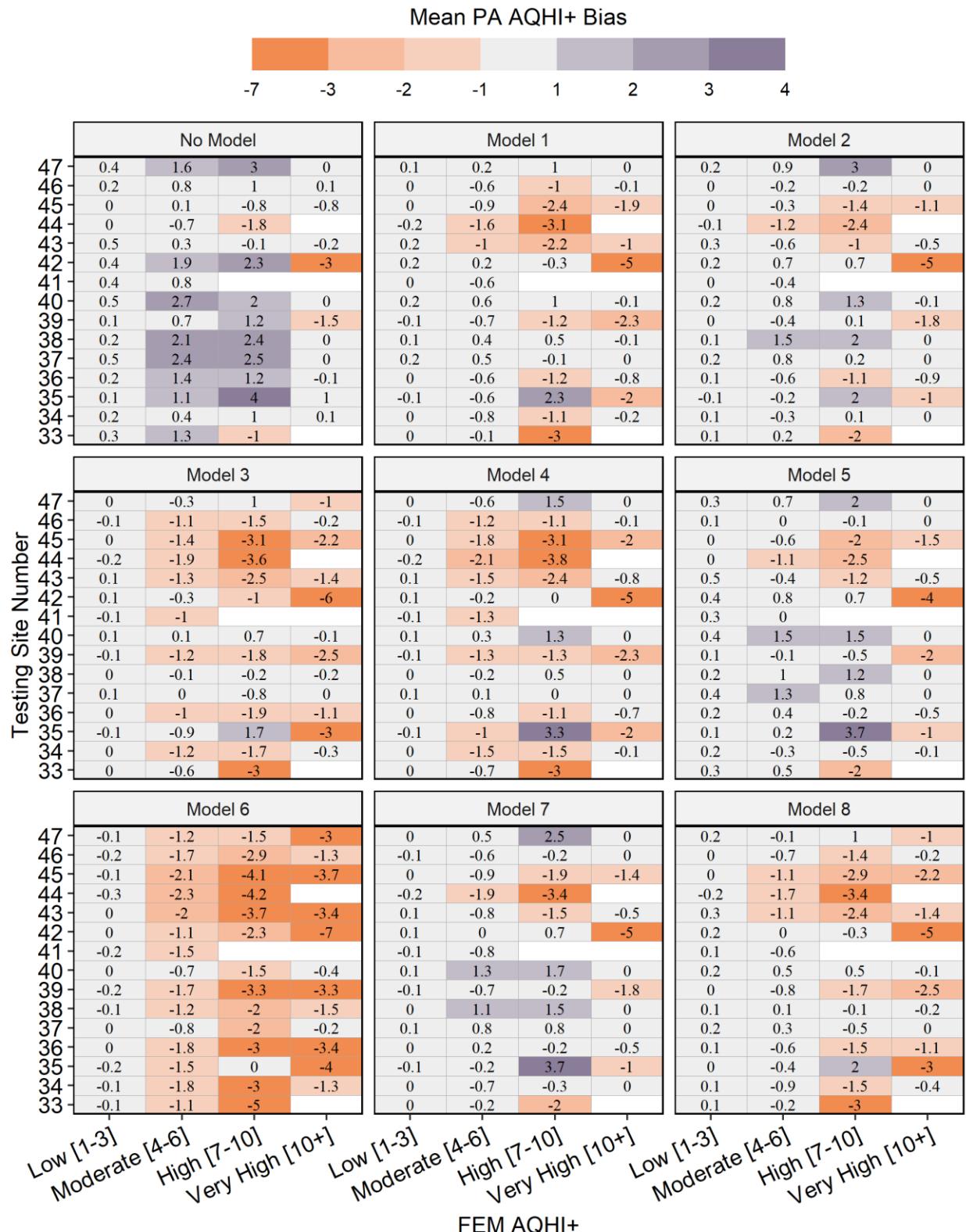


Figure S4. Mean PurpleAir AQHI+ bias for each correction model (including the raw data) at Federal Equivalent Method (FEM) AQHI+ levels at individual testing sites (See Table 1). A value at or near 0 is preferred, especially for higher AQHI+.