Comparison of Monitoring Data to Model Estimates at a DRR source in Shelby County, Alabama

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ADEM has obtained the actual, quality-assured monitor data for the first three months of 2017 near a DRR source in Shelby County, AL. We assembled a met data set and ran the AERMOD model (v16216r) to provide data for a comparison of reality versus model. We did not add any background concentrations to the model results, which means that the model data is underestimated by a few $\mu g/m^3$ for conservatism. The NAAQS for SO2 is 196 $\mu g/m^3$, 4^{th} high, averaged over three years. The number of hours available for comparison varies because of calibration downtimes at the monitor.

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Highest 1-hour concentration of the 1879 hours in the three months as predicted by the model: **1789** ug/m^3

Highest 1-hour concentration of these hours as measured: **121** ug/m^3

Difference: Model over predicts by a factor of **14x**.

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4^{th} highest concentration from modelling: **1153** ug/m^3

4^{th} highest concentration from monitor: **33.8** ug/m^3

Difference: Model over predicts by a factor of **34x**.

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Average of all 2160 hours in the 3-month period as predicted by model: **25.08** ug/m^3

Average of all hours (1879) monitored: **0.89** ug/m^3

Model over predicts by a factor of **28x**.

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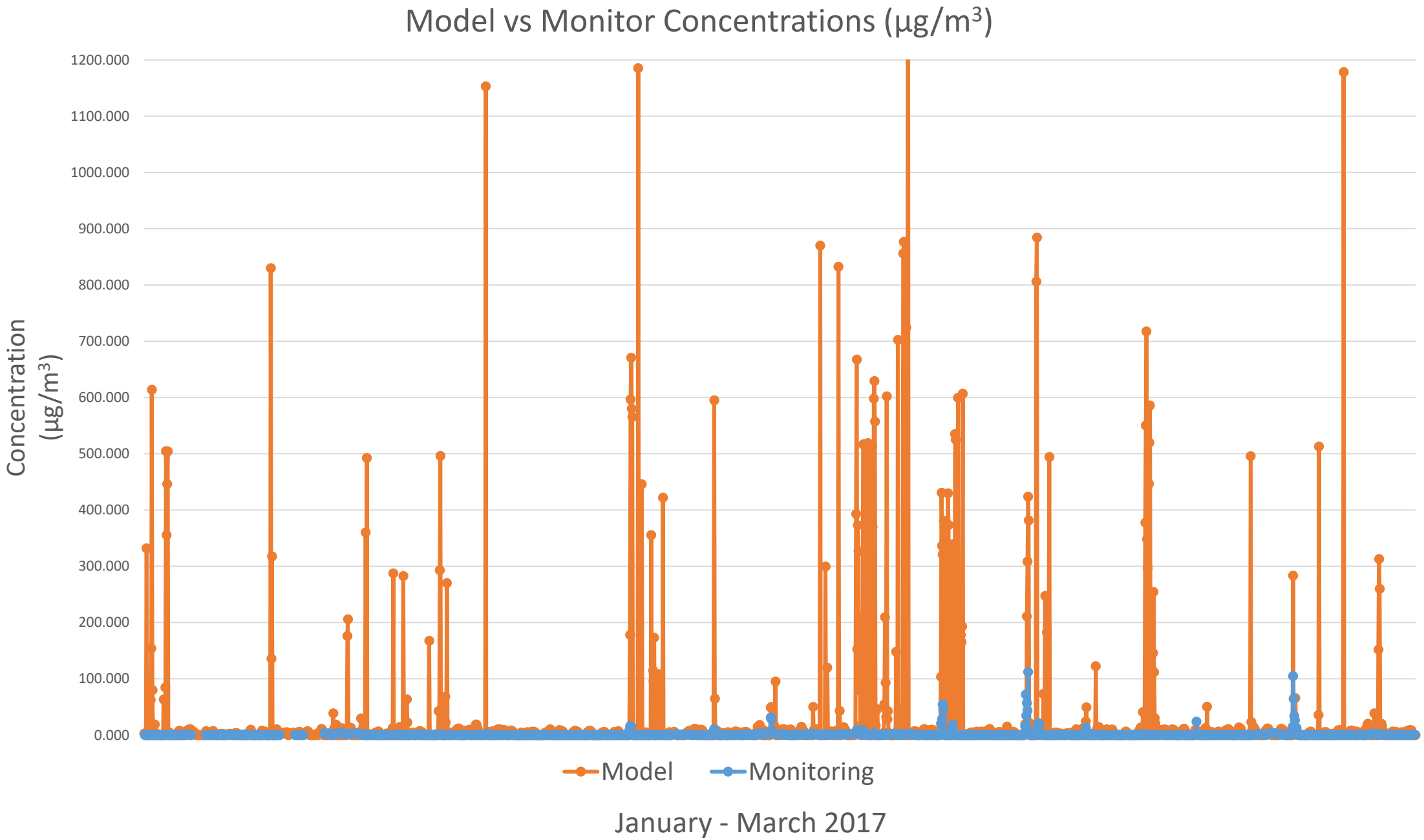
Out of 1879 hours, the number of hours the model over predicts versus monitoring: **1250**, or **67.5%**

Out of 1879 hours, the number of hours the model under predicts versus monitoring: **286**, or **15.2 %**


Model vs Monitor Concentrations (µg/m3)
1200.000
1100.000
1000.000
900.000
800.000
700.000
600.000
500.000
400.000
300.000
200.000
100.000
0.000
Concentration (µg/m3)
Model
Monitoring
January - March 2017

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The reason that a monitor is installed and operating near this source is that the full 3-year model predicted a NAAQS violation. The above data show that an actual violation is unlikely, and that the model tends to be very conservative.