

### Technical Addendum: Updated AQS/AirNow Data Comparison

OAQPS updated the analysis presented in the technical memorandum “Response to Office of Inspector General Management Alert: Certain State, Local and Tribal Data Processing Practices Could Impact Suitability of Data for 8-hour Ozone Air Quality Determinations”, posted on the EPA website on February 10, 2017. The updated analysis adds data from calendar year 2016 to the original set of measured hourly ozone concentrations from the Air Quality System (AQS) and AirNow databases, and also makes two minor corrections to the data.

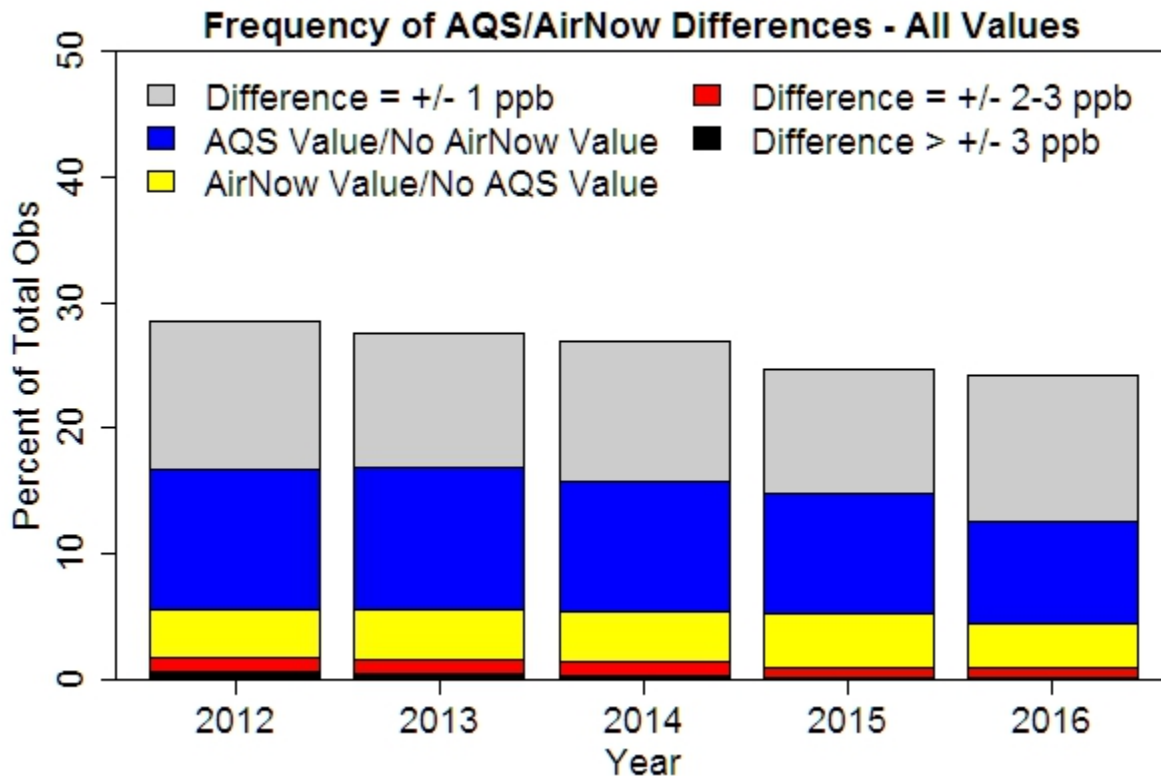
The first correction involves situations where two or more monitors operated simultaneously at the same site. The original dataset incorrectly combined the data from the individual monitoring sites, while the updated analysis uses only data from the primary monitor, which are the data that get reported to AirNow. This correction affected approximately 20 monitors nationally.

The second correction affects about 40 sites where the AQS and AirNow concentration values were not properly matched in time in the original dataset. The AirNow concentrations in the original data were shifted by 1 or 2 hours from the AQS concentrations, mostly in states spanning two time zones. The AirNow data for each of these sites were adjusted manually so that the concentrations were properly aligned with the AQS data.

Figure 1 below shows the same bar chart presented in the original analysis using the updated dataset. Largely a result of the corrections described above, Figure 1 now shows lower rates of differences between the AQS and AirNow concentrations, with the reductions largely falling into the two categories of greatest concern covering differences greater than +/- 1 ppb. The difference rate appears to be decreasing over time, with the lowest rates occurring in 2015 and 2016. Based upon this updated analysis, we can make the following conclusions:

- Overall, there was about a 26% difference rate (or 74% agreement rate) between the AQS and AirNow databases for the 2012-2016 period, with the highest difference rate of 29% occurring in 2012, and the lowest difference rate of 24% occurring in 2015 and 2016. This is slightly lower than the 27% difference rate reported by the original analysis, and is in perfect agreement with the 26% difference rate reported by the OIG memorandum.
- The three categories including: 1) records showing a difference of 1 ppb between the AQS and AirNow concentration values (gray bars, 11%), 2) records where a value was present in AQS but not in AirNow (blue bars, 10%), and 3) records where a value was present in AirNow but not in AQS (yellow bars, 4%) did not change as a result of the updates to the analysis.
- The rate of differences of 2 or 3 ppb between the AQS and AirNow values (red bars) decreased from 1.5% in the original analysis to 1.0% in the updated analysis. The lowest difference rates of approximately 0.7% occurred in 2015 and 2016.
- The rate of differences of more than 3 ppb which represent the greatest potential for concern in terms of quality assurance practices and overall data quality (black bars) decreased from 0.5% in the original analysis to 0.3% in the updated analysis. Years 2015 and 2016 again showed the lowest difference rates with about 0.2% of all records falling into this category.

In general, the updated analysis shows even less cause for potential concern from a data quality perspective compared to the original analysis, with the difference rates in the final two categories (red and black bars) representing only 1.3% of the ozone data collected during the 2012-2016 period, and less than 1% of the ozone data collected during the most recent two years.



**Figure 1. Annual Rate of Differences in Hourly Ozone Concentrations between AQS and AirNow Databases, 2012-2016**