

PM NowCast



The NowCast method reports the Air Quality Index (AQI) in real time for particulate matter (PM).

The Air Quality Index



The AQI is used to report daily air quality levels.

Health research for PM measures exposure over a 24-hour period. However, people need real-time air quality information in order to make immediate health-related decisions.

The NowCast estimates a value of the AQI each hour and better reflects changing air quality conditions.

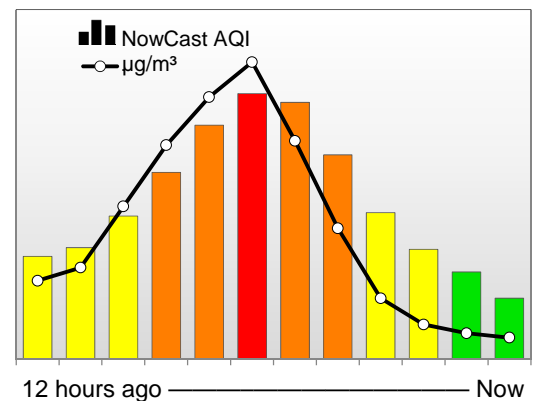
More information about the AQI can be found at www.AirNow.gov.

How the NowCast Works

The NowCast uses hourly PM measurements to estimate a real-time AQI.

The daily AQI for PM is calculated using a 24-hour average, meaning the true AQI can't be calculated until that period is over. To provide an AQI estimate in real time, the NowCast uses a weighted average of the past 12 hourly measurements.

When hourly PM measurements change quickly, the most recent hourly measurements of the past 12 hours are weighted more heavily to better reflect the rapidly changing air quality conditions. However, when hourly measurements are very similar during the past 12-hour period, each hour is weighted almost equally.



Calculating the NowCast

Use the past 12 hours of PM measurements in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$):

1. Select the minimum and maximum PM measurements.
2. Subtract the minimum measurement from the maximum measurement to get the range.
3. Divide the range by the maximum measurement to get the scaled rate of change.
4. Subtract the scaled rate of change from 1 to get the weight factor.
5. If the weight factor is less than 0.5, then set it equal to 0.5.
6. Multiply each hourly measurement by the weight factor raised to the power of the number of hours ago the value was measured.
7. Compute the NowCast by summing the products from Step 6 and dividing by the sum of the weight factor raised to the power of the number of hours ago each value was measured.
8. Convert this value to AQI. A concentration to AQI converter is available at www.airnow.gov/index.cfm?action=resources.conc_aqi_calc.

See the NowCast calculated using sample data at www.epa.gov/airnow/faq/Nowcast-formula.pptx.

Questions?

AirNow Support Portal
<http://airnow.supportportal.com>

AirNow Data Management Center
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