Computing the NowCast

1. Compute the concentration range (max-min) over the last 12 hours. This tells us how much the air has changed, but relative to what? We need to scale it.

Example 12-hour period

50 80 75 90 82 53 64 74 21 10 16 13

Range = 90-10 = 80 ug/m3

2. Divide the range by the maximum concentration in the 12-hour period

Scaled rate of change is 80/90.

3. Compute the weight factor by subtracting the scaled rate of change from 1. The weight factor must be between .5 and 1. The minimum limit approximates a 3-hour average. If the weight factor is less than .5 then set it equal to .5.

Weight factor is 1 – 80/90 = .11 → less than .5, so use .5

4. Multiply each hourly concentration by the weight factor raised to the power of how many hours ago the concentration was measured (for the current hour, the factor is raised to the zero power)

$13*(.5)^0 + 16*(.5)^1 + 10*(.5)^2 + 21*(.5)^3 + 74*(.5)^4 + \ldots$

5. Compute the NowCast by summing these products and dividing by the sum of the weight factors raised to the power of how many hours ago the concentration was measured.

$$\frac{13*(.5)^0 + 16*(.5)^1 + 10*(.5)^2 + 21*(.5)^3 + 74*(.5)^4 + \ldots}{(.5)^0 + (.5)^1 + (.5)^2 + (.5)^3 + (.5)^4 + \ldots}$$

= 17.4 ug/m3