

DATADELVE

How to read India's new colour-coded Air Quality Index

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It. You could also have some major questions, but we'll get to that in a bit.

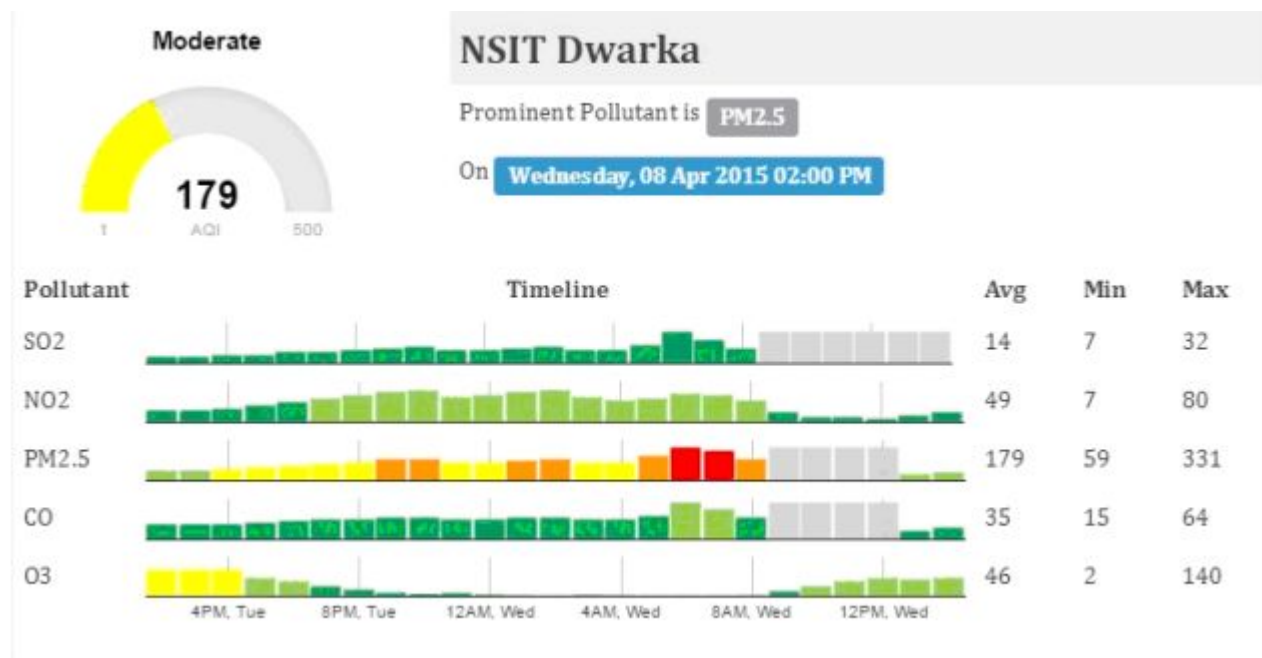
Most developed countries have a colour-coded Air Quality Index that helps citizens look up the air quality at a monitoring station near them, and decide what precautions to take based on it – keep the kids home from school, or put off that run, for example. India's AQI announced on Monday is based on [recommendations](#) by the Indian Institute of Technology, Kanpur.

In India, as in many other countries, the Index is centred around five chief pollutants – Particulate Matter with a diameter less than 10 micrometres (PM10), Particulate Matter with a diameter of less than 2.5 micrometers (PM2.5), ozone (O3), Nitrogen Dioxide (NO2), and Carbon Monoxide (CO). A monitoring station should be able to give you the concentration of a particular pollutant at that moment in time, and its average over a period of time – for CO and O3, the average is taken over eight hours, while for the other three, it is a 24-hour average. The unit of measurement is microgram (or milligram in the case of CO) per cubic meter.

India has set standards for what it thinks are appropriate warnings for a particular level of pollutant. Here's what the code is:

51-100	Satisfactory		Minor breathing discomfort to sensitive people
101-200	Moderate		Breathing discomfort to the people with lungs, asthma and heart diseases
201-300	Poor		Breathing discomfort to most people on prolonged exposure
301-400	Very Poor		Respiratory illness on prolonged exposure
401-500	Severe		Effects healthy people and serious impacts to those with existing diseases

What does this actually mean? Here's what the readings of a monitoring station in Dwarka (Delhi) looked like as of 2 pm on Wednesday.



What the Index does is colour code each pollutant's AQI reading according to the official code, and then assign an overall AQI on the basis of top pollutant's reading. So since Dwarka has the highest PM 2.5 readings out of all its pollutants, its overall AQI is the PM 2.5 value. If a city has higher CO readings than PM 2.5 at a given time, CO will be the chief pollutant, and its value will be that city's AQI.

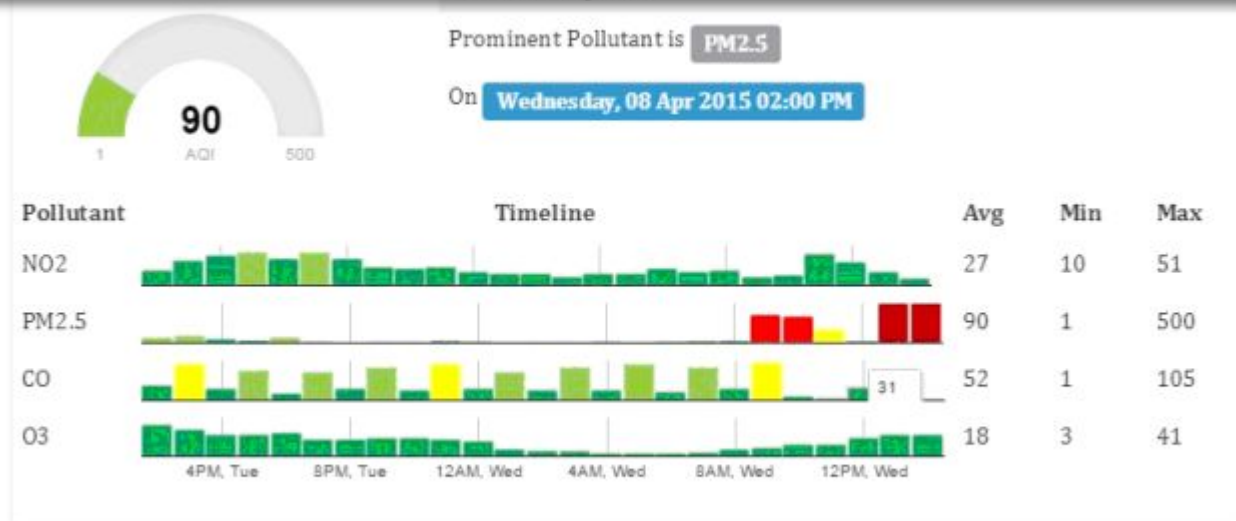
It's worth remembering that the values here are not the actual concentrations of that pollutant, but the concentration weighted to the scale. I called up Mukesh Sharma, Professor in the Department of Mechanical Engineering at IIT Kanpur, who developed the AQI, to explain it a little for me. Here are the "breakpoints", meaning the boundary values that tip a pollutant from say the "good" category to "satisfactory".

(Range)	24-hr	24-hr	24-hr	8-hr	8-hr (mg/m ³)
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10
Poor (201-300)	251-350	91-120	181-280	169-208	10-17
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34
Severe (401-500)	430 +	250+	400+	748+*	34+

**One hourly monitoring (for mathematical calculation only)*

This helped me solve one of the puzzles I referred to in the beginning. On Monday when the index came out, I calculated averages for the first week of April, and **>found that** BTM Layout in south Bengaluru actually had the highest AQI of all locations currently measured. The Karnataka State Pollution Control Board swung into action the next day and **>claimed that** it had confused the CO and PM 2.5 readings. This is demonstrably false.

CO values never soar into the range of 350+ which BTM Layout's PM 2.5 values were when I did the story – they rarely cross double digits. Look at BTM Layout's readings as of 2 pm on Wednesday.



Its current PM 2.5 readings were a huge 500 which would be classified as an emergency in most countries. Its 24-hour PM 2.5 average, of course, were considerably lower.

All of which only highlights the biggest problem with the AQI: it hasn't been attached to an action plan. If I live in BTM Layout and looked at the website at 2 pm, what was I to do? Should schools shut, cars go off the road, factories shut? We don't yet know what to do with the AQI, except look it at and panic.

A letter from the Editor

Dear reader,

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