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MEMORANDUM

TO: Environment and Natural Resources Committee
FROM: Kristin Heery, Ross Patronsky
RE: Regional Air Quality Snapshot update
DATE: August 27, 2008

This memo serves to update the Committee on the Regional Air Quality Snapshot, scheduled to be completed late Fall 2009. In the initial presentation to the Committee, the proposed outline for the Snapshot was reviewed. This outline is attached at the end of this memo for reference.

The focus of this update is to review Section III of the report, which covers the region's existing air quality conditions. The data used in this Section were taken from annual information reported by IEPA to U.S. EPA and supplemental information supplied directly from IEPA.

The basic data reviewed are exceedences, those days on which air quality monitors show that pollution levels are higher than the National Ambient Air Quality Standards (NAAQS). These data are important because the exceedences lead to the finding of air quality nonattainment for the region. In addition to looking at current exceedences, the analysis seeks to portray current conditions of air quality over time and on a more "every day" basis – beyond what is tracked for the Clean Air Act. The focus is on ozone and particulate matter (PM) pollution.

This section of the report, Section III: Our Region's Air Quality, is divided into four subsections:

1. Standards, identifying the NAAQS for ozone and PM;
2. Data/Monitoring, describing the data sources and monitors;
3. Ozone levels and trends; and
4. PM levels and trends.

Standards

NAAQS are set by regulations under the Clean Air Act; when they are not met, a region is deemed to be in nonattainment. Northeastern Illinois is in nonattainment for ozone and PM_{2.5}. The following are the standards for these two criteria pollutants.

Ozone

- 0.075 ppm (revised to this level in 2008)
- Measured on 8-hour average

- Violations tracked at 3-year average of 4th highest daily maximum

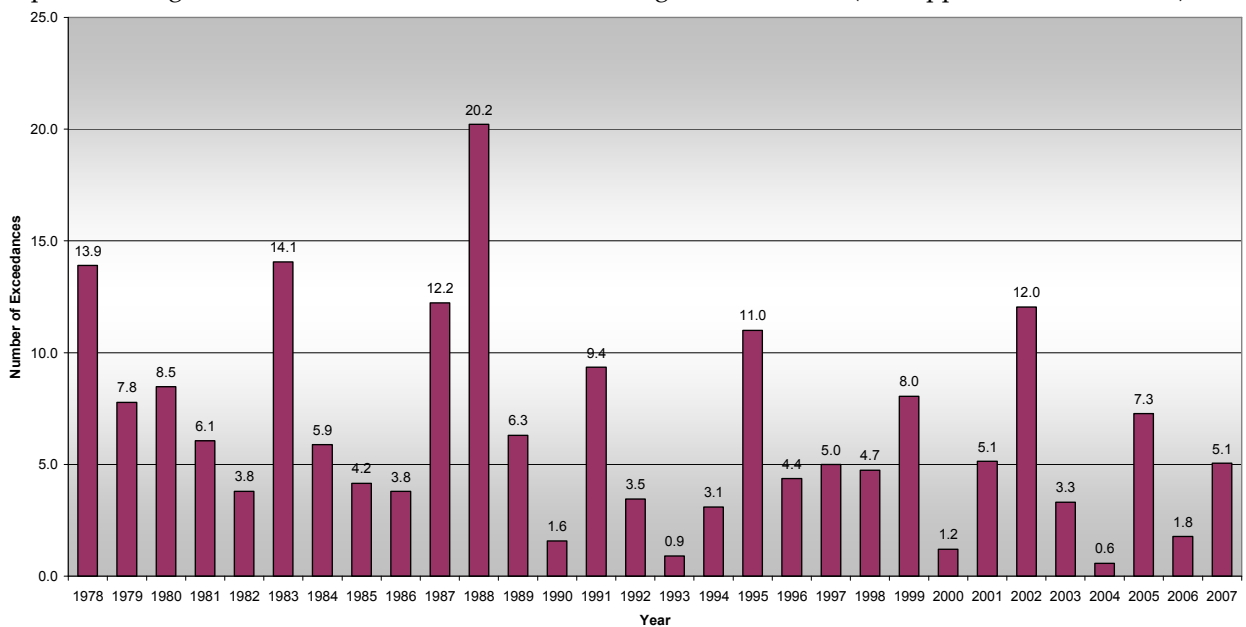
PM_{2.5}

- 15 µg/m³ annual mean
- 35 µg/m³ daily average

Ozone

To understand ozone levels beyond the strict regulatory context, data from all monitors across the region was downloaded and analyzed. Graph 1 represents the average number of exceedances across all regional monitors per year. For example, in 2007, each monitor across the region exceeded the standard for about 5 days.

Graph 1: Average Number of Exceedances Across All Regional Monitors (0.075 ppm 8-hour standard)

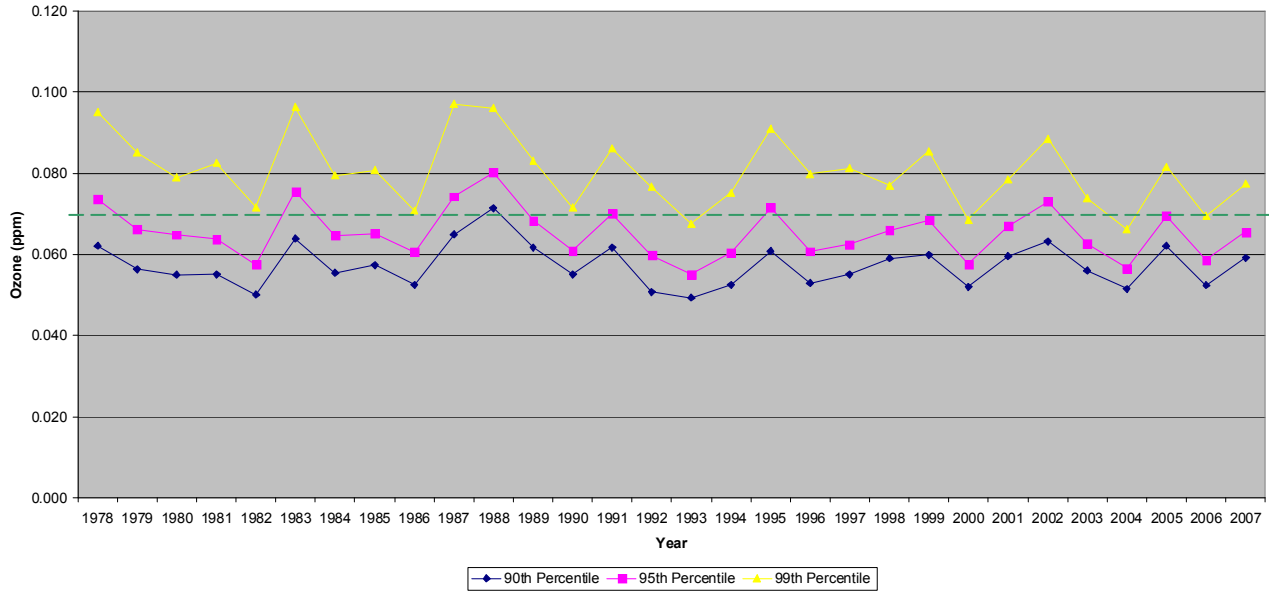


To understand ozone pollution on a more routine basis, average levels were reviewed. However, average ozone levels are affected by different photochemical processes under different weather and sunlight conditions. Separating the different situations into meaningful categories is a research issue beyond the scope of this snapshot. Therefore, Graph 2 takes a look at three divisions of regional average ozone levels – the 90th, 95th, and 99th percentiles. Because the “ozone season” is approximately 200 days per year, the 90th, 95th, and 99th percentiles are the equivalent of the worst 20, 10, and 2 days per year respectively. (The dashed green line represents 0.075 ppm, the standard.)

As portrayed in the graph, the regional average’s worst 2 days each year (the 99th percentile) are usually above the standard, which underscores why the region is in nonattainment. But perhaps a more interesting story is that the regional average’s worst 10 days per year and worst 20 days per year hover just below the standard. It is important to note that there are other factors at play in this evaluation, including high levels of background ozone coming in from

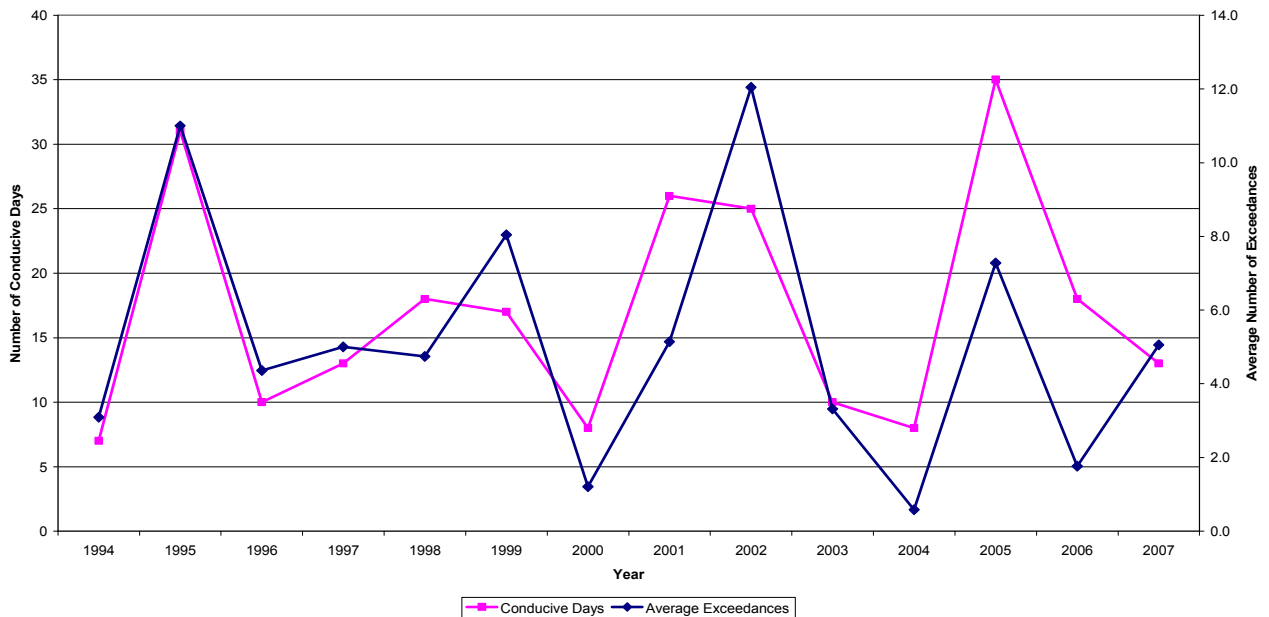
other regions. This issue, and how to portray it effectively, will be explored further, along with critical review by IEPA.

Graph 2: Annual Average 8-Hour 90th, 95th, 99th Ozone Levels Across All Regional Monitors



It is important to point out that ozone levels are highly related to weather. IEPA tracks “ozone conducive days” – days when weather patterns favor the chemical reaction that creates ozone from emissions. Perhaps more than any other variable, the number of conducive days plays a key role in excessive ozone levels, as evidenced in Graph 3, where the two values are clearly highly correlated.

Graph 3: Average Ozone Exceedances Across All Regional Monitors vs Number of Conducive Days

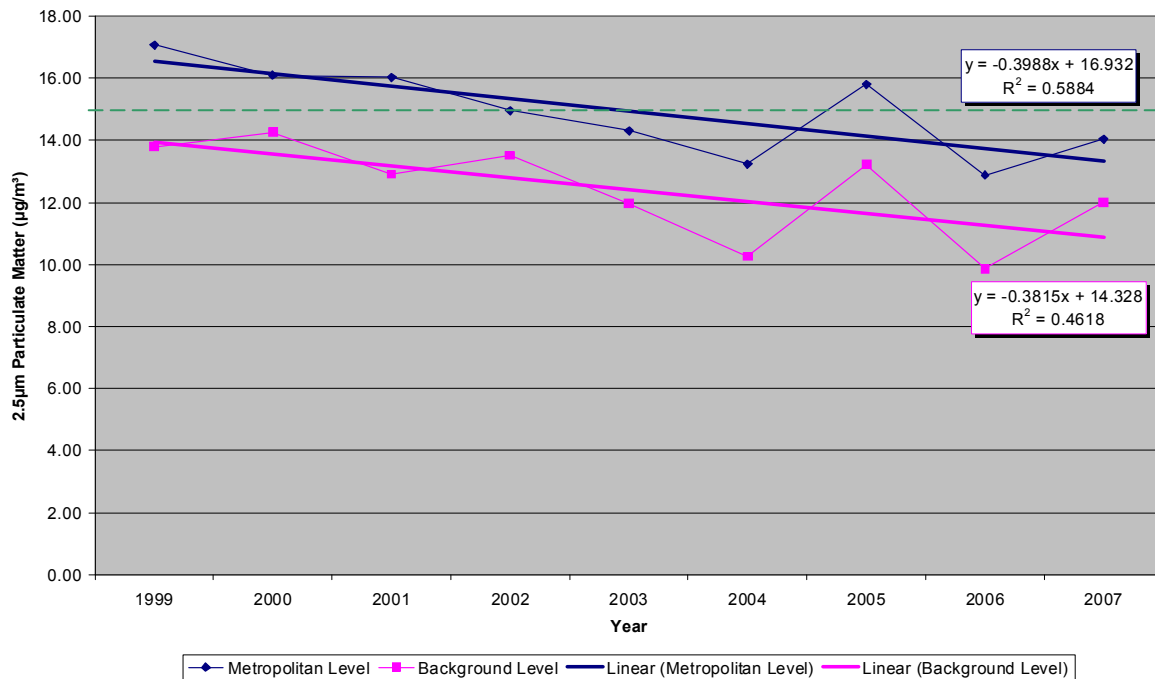


Particulate Matter (PM_{2.5})

To understand PM_{2.5} levels beyond the regulations, data from all the monitors across the region was downloaded and analyzed. However, PM_{2.5} has only been monitored for the last ten years, with the standard just going into effect in 2004, after their initial promulgation in 1997. 24-hour exceedance data is only available for 2007 because it is the first time our region didn't meet the 24-hour standard. For this year, the data showed a regional average of about 3 days exceeding the 24-hour PM_{2.5} standard per monitor across the region.

Perhaps a better understanding of PM_{2.5} is revealed when evaluating the annual concentration, averaged across all regional monitors. This is plotted in Graph 4, along with a plot line of the background level of PM_{2.5} (as measured by a monitor in southwestern Will County). This graph shows a clear downward trend, indicating that the annual average PM_{2.5} levels are improving. (The dashed green line is 15 µg/m³, the standard.)

Graph 4: Annual Average PM_{2.5} Across All Regional Monitors, Annual Average Background Level



Discussion/Next Steps

- Recommendations on how to address these “every day” ozone conditions, which may not register as exceedances, but hover just below the standard?
- Recommendations on how the region can be brought back into compliance for PM_{2.5}?
- Recommendations on how to address mega-region scale air quality? Pollutants blowing in from other regions?