

FOGGY FACTS ON SMOG

NC Ozone Levels Aren't Bad or Getting Worse

Summary: Flawed studies and ignorance about North Carolina air quality have given lawmakers and the general public an inaccurate picture of trends in ground-level ozone, or “smog,” in some cases exaggerating public exposure by a factor of 10. This study reexamines air-quality data from monitors across the state, concluding that exposure to dangerous ozone levels is surprisingly rare — and is dropping even without passage of the proposed “Clean Smokestacks” legislation.

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In the heat of debates surrounding the so-called “Clean Smokestacks” bill in North Carolina, a great deal of rhetoric has been forthcoming about the state’s “ozone problem.” While the bill’s supporters frequently infer that ground level ozone, otherwise known as “smog,” is a serious problem and getting worse, legislative or news media examination of the actual data is rarely pursued. Indeed, it could be argued that such an examination has been judiciously avoided.

When data concerning ground level ozone is referred to at all it is usually in regards to last year’s study by the American Lung Association that portrayed North Carolina in a particularly negative light. But what is rarely mentioned, and never by the bill’s supporters, is that the ALA study, which also contained serious methodological flaws, focused on the years 1997 to 1999. These were the worst years of the last decade and were completely inconsistent with the years that both preceded that period and the two years that have followed (see Figure 1 on the next page).

The anomaly that these years represented was caused by the El Nino weather patterns that were having a dramatic impact on temperatures throughout the Southeast. Furthermore these three-to five-year-old data are typically represented as reflective of current conditions which, as the evidence shows, is false.¹

This study looks at actual ozone data and trends from 1993 to 2001, published by the N.C. Department of Environment and Natural Resources, Division of Air Quality.² What we find is that ground-level ozone in the state has been steadily improving for the last three years and 2001 was clearly the best year since 1993. For the nine years studied there is absolutely no evidence to suggest that the ozone problem in North Carolina has been getting worse and plenty of evidence to suggest that over the last three years, it has been getting better.

What is Ground Level Ozone?

Ozone is not directly emitted from either smokestacks or tailpipes. Instead, it occurs as a result of a chemical reaction between volatile organic compounds (VOCs) and emissions of nitrogen oxide (NOx) that occur in the presence of sunlight.

VOCs refer to a number of gasses that are emitted in the air from many sources including gasoline at pumps, paint cans, chemicals from dry cleaners, and even trees and insects. For this reason, sometimes relatively high natural background levels of ozone will occur in heavily forested areas of the country like North Carolina, where there can be both high levels of naturally occurring VOCs and intense sunlight. Therefore ozone is not strictly a product of human-generated pollution. NOx, on the other hand, is a human-generated pollutant from coal-fired plants and automobiles. Since sunlight is an essential ingredient for the formation of ozone, it is likely to

be at its highest levels when the sun is most intense; that is, in the late spring and summer months, May to September, during midmorning to late afternoon. Also, ozone concentrations tend to be very localized. In a given city, one ozone monitor may have a particularly high reading while a few blocks away another monitor may show relatively low ozone levels.

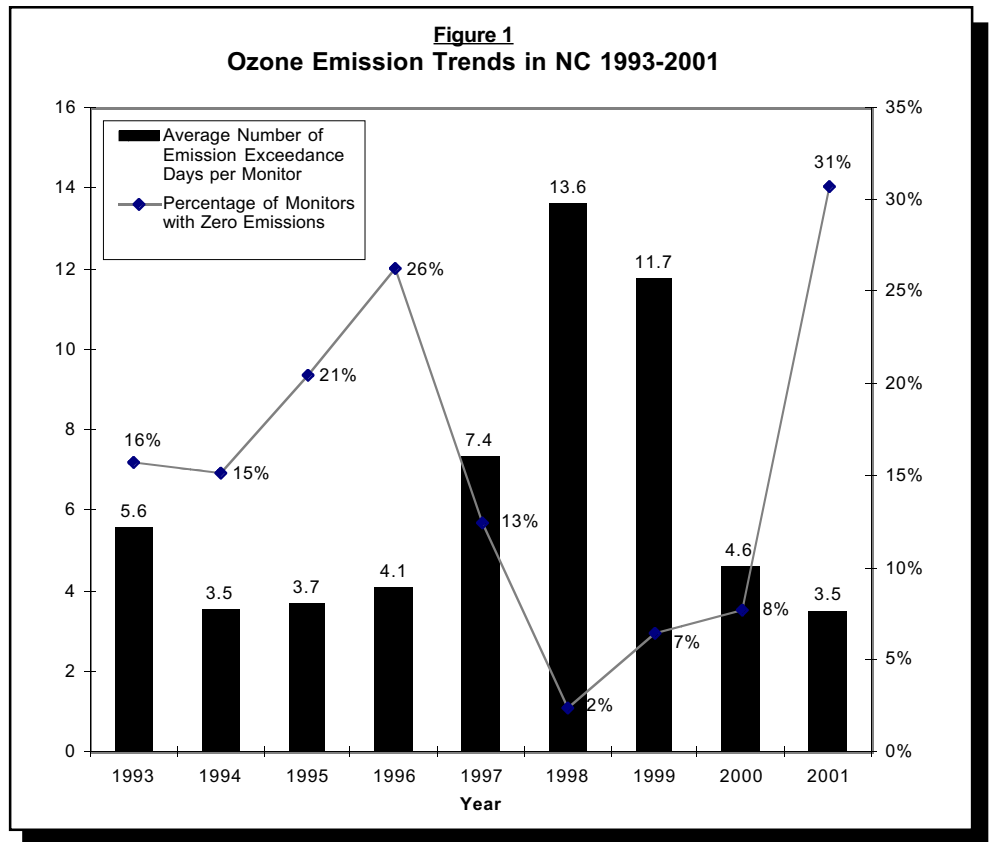
Ozone is measured in terms of parts per billion (ppb) of ambient air. Over the past several years there has been considerable controversy over the issue of what constitutes dangerous levels of ozone and new standards that have been approved, but not yet instituted, by the EPA. Officially, the EPA recognizes an ozone exceedance when a monitor in a particular location reads 120 ppb for one hour over the course of a 24-hour period. This standard has been in place since 1979. Most of the country, including North Carolina, has been and is in compliance with this standard.

But unofficially the standard is much more stringent than this. In 1997 the EPA approved a controversial change in the National Ambient Air Quality Standards (NAAQS) from the 120 ppb / 1hr. standard to 85 ppb over eight hours for a 24 hour period. The EPA's own Clean Air Scientific Advisory Committee refused to endorse the standard.³ This standard has been under challenge in the courts and, consequently, it has not officially been put in place at the federal level.⁴ On the other hand North Carolina implemented this standard unilaterally and, in anticipation of an eventual official change at the federal level, the 85 ppb standard has become the threshold level for both activist groups and media reports on the issue. Indeed it is not uncommon for media outlets to refer erroneously to 85 ppb as the federal standard.⁵ For purposes of this analysis, the more stringent 85 ppb standard is used. An ozone exceedance day in a particular location is any day where the monitor in that location shows a reading that violates this standard, i.e., has a reading of 85 ppb or higher over an eight-hour period.

Ozone in North Carolina As A Whole

The N.C. Department of Energy and Natural Resources (DENR) reported 33 ozone exceedance days during the ozone season of 2001. But the state's method of reporting is somewhat misleading. One would assume from this number that the general population suffered through 33 high ozone days last summer. This assumption would be wrong. In fact, the typical North Carolinian living in a community where the air is monitored was exposed to about one-tenth that number.

There are 52 ozone monitors scattered throughout the state (as an aside, this is the 6th highest number of monitors in the nation).⁶ What DENR is actually telling us with this number is that there were 33 days last summer where at least one monitor somewhere in the state registered an ozone exceedance day. As noted, ozone is very localized and ozone monitor readings only tell us what is going on in that particular location. A high ozone reading at a location in Charlotte, for example, would tell us nothing about ozone levels in Raleigh or possibly even levels on the other side of town from the monitor. As



will be noted below, this was the case in Raleigh last summer. In reality, the number for the state as a whole tells us very little about the degree to which North Carolinians are exposed to ozone levels above the state standard.

In our analysis we broke this number down and looked at ozone exceedances on a per-monitor basis. This gives us a better view of the ozone problem facing particular communities and allows us to make year to year comparisons, which is not possible otherwise because the total number of monitors in the state has been increasing over time. What we found was that, statewide, ozone monitor readings averaged only 3.5 exceedance days for the entire 2001 season (see Figure 1). None of these readings showed anything greater than a “code orange.” This is the lowest possible level of exceedance and, according to the Environmental Protection Agency’s Clean Air Science Advisory committee, includes a range that, in terms of human health effects, is indistinguishable from levels that are as much as 15 ppb below the 85 ppb threshold.⁷ Furthermore, fully 31 percent of the monitors in the state registered no exceedance days at all during 2001. This was the highest percentage of zero exceedances during the entire nine year period that we examined. (See the solid line in Figure 1.)

The Cities and the Smoky Mountains

The ozone data for North Carolina’s three largest metropolitan areas and the Smoky Mountain region near Asheville also defy conventional mythology. Over the last year it has been reported that the ozone problem in these four areas is completely unacceptable. Again, the implication has been that the ozone problem is bad and getting worse. A careful analysis demonstrates that this perception is false. We assessed the ozone data in the state’s metropolitan areas by looking at ozone monitors in Wake County (Raleigh), Mecklenburg County (Charlotte), and the Triad counties of Forsyth and Guilford (see Figure 2). In 2001 the four monitors in Wake County registered an average of only 2 ozone exceedances each. Two of these monitors registered 4 exceedances while the other two registered none. Furthermore, one of the monitors that registered 0 exceedance days was in the heart of Raleigh at WRAL-TV’s studios. It should also be noted that in 2001, Wake County registered, on average, the lowest number of exceedance days for the entire nine-year period examined.

With an average of 8 per monitor, Mecklenburg County showed a greater number of ozone exceedance days than did Wake and the highest of the three major metropolitan areas. But this number also needs to be put in perspective. It is the lowest number of exceedances since 1994 and it is part of a downward trend that started in 1997. In fact ozone exceedance days in Mecklenburg County are down 66 percent from their 1997 peak.

Forsyth and Guilford counties jointly averaged 6.8 ozone exceedance days during 2001. While this is still relatively low, particularly compared to the peak years for the area (1998 and 1999) it does represent a slight increase over 2000.

Figure 2
Average Exceedances in NC’s Major Metropolitan Areas 1991-2001

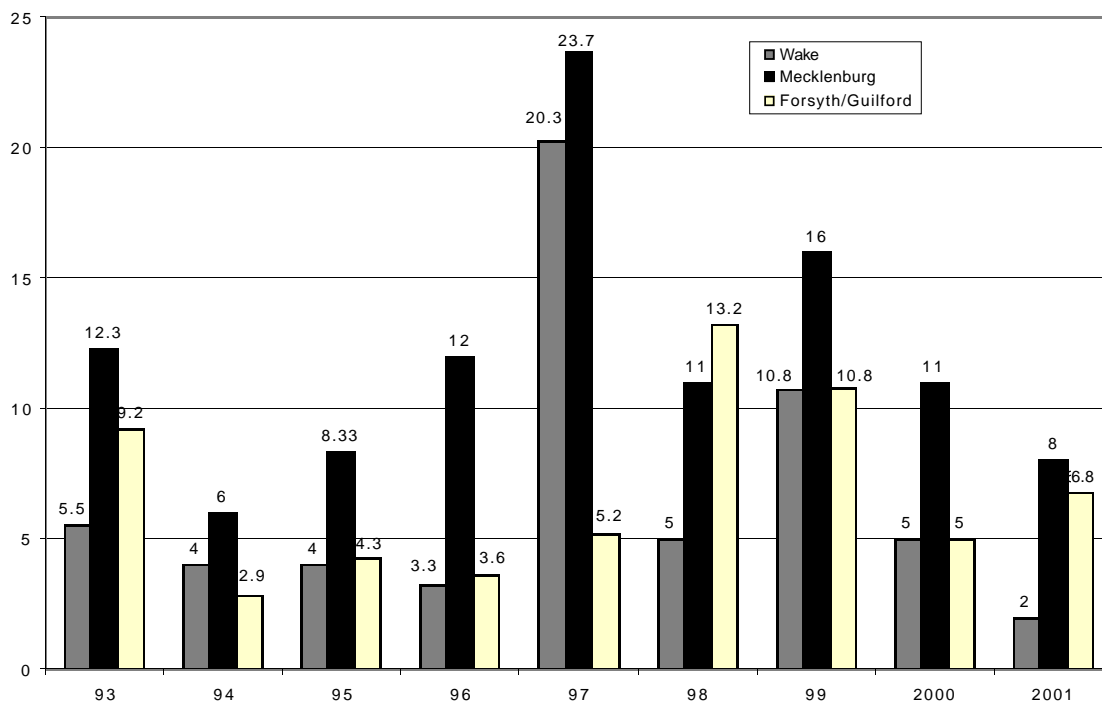
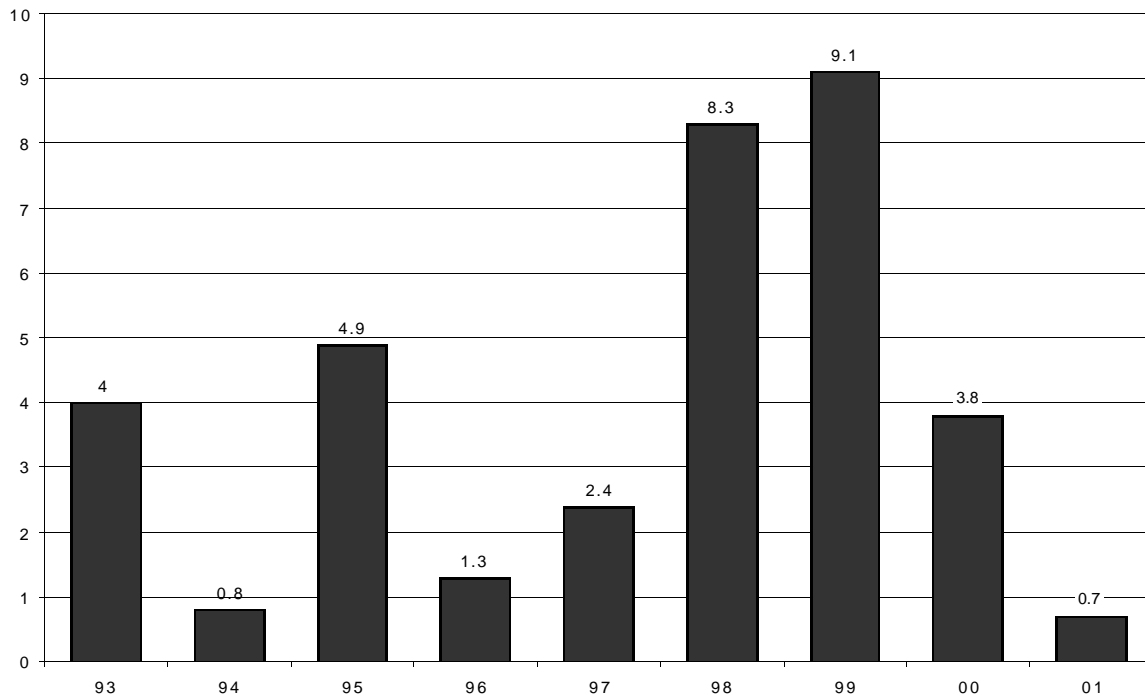


Figure 3
Smoky Mountain Ozone Exceedance days - average per monitor



One of the most repeated arguments in favor of the proposed “Clean Smokestacks” legislation centers around the suggestion, never backed up by actual data, that the far western Smoky Mountains are, to use the colorful language of one reporter, being “bathed” in pollution. Once again, the facts tell a totally different story (see Figure 3). In 2001 the seven monitors located in the region averaged 0.7 ozone exceedance days for the year. Four of the seven registered no exceedance days; two registered 2 each and one registered 1. Indeed, from these data it is difficult to detect any significant ozone “problem” that has faced this region in the past decade. It appears that the portrait of the smog “problem” in the mountains painted by radical activist supporters of the bill and their allies in the legislature and media has absolutely no basis in fact.

Conclusion

For the last year, as the legislature and the public policy community has debated the proposed “Clean Smokestacks” legislation, very little attention has been focused on actual pollution data. Instead of investigating the facts, media attention has focused on sensational and typically unsupported claims of radical environmental advocacy groups and their supporters in the General Assembly. It is hoped that the data presented here will shed some light, rather than heat, on the true nature of the ozone “problem” and allow our state legislature to come to a reasoned decision that is based on facts not fear.

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Notes

¹ See “That mountain air,” *Raleigh News & Observer*, editorial, February 4, 2002 and Roy Cordato, “Overstating smog’s toll,” letter to the editor and “editor’s note” in the March 2, 2002, *Raleigh News & Observer*.

² All data in this study are based on ozone monitor readings found at www.daq.state.nc.us/monitor/data.

³ “CASAC Closure on the Primary Standard Portion of the Staff Paper for Ozone,” Clean Air Scientific Advisory Committee, U.S. Environmental Protection Agency, EPA-SAB-CASAC-LTR-96-002, November 30, 1995.

⁴ For a discussion of the latest legal controversy, which centers around the EPA’s refusal to calculate the health benefits that are associated with ozone in proposing their new standard, see Randall Lutter and Howard Gruenspecht, “Assessing Benefits of Ground Level-Level Ozone: What Role for Science in Setting National Air Quality Standards?” *Regulatory Analysis* 01-04 (Washington, D.C.: AEI-Brookings Center for Regulatory Studies) May 2001.

⁵ Ron Scherer, “Haze Hangs Over US Summer,” *Christian Science Monitor*, June 18, 2001, p.1.

⁶ It should be noted that interstate rankings and comparisons of ozone levels that do not adjust for the number of monitors, such as those published by the American Lung Association each year, are meaningless. Such studies will always be biased against states with more monitors. This is why North Carolina typically does not fare well in these comparisons.

⁷ Op.cit. at note 3.