Why Air Quality Is Better than You Think

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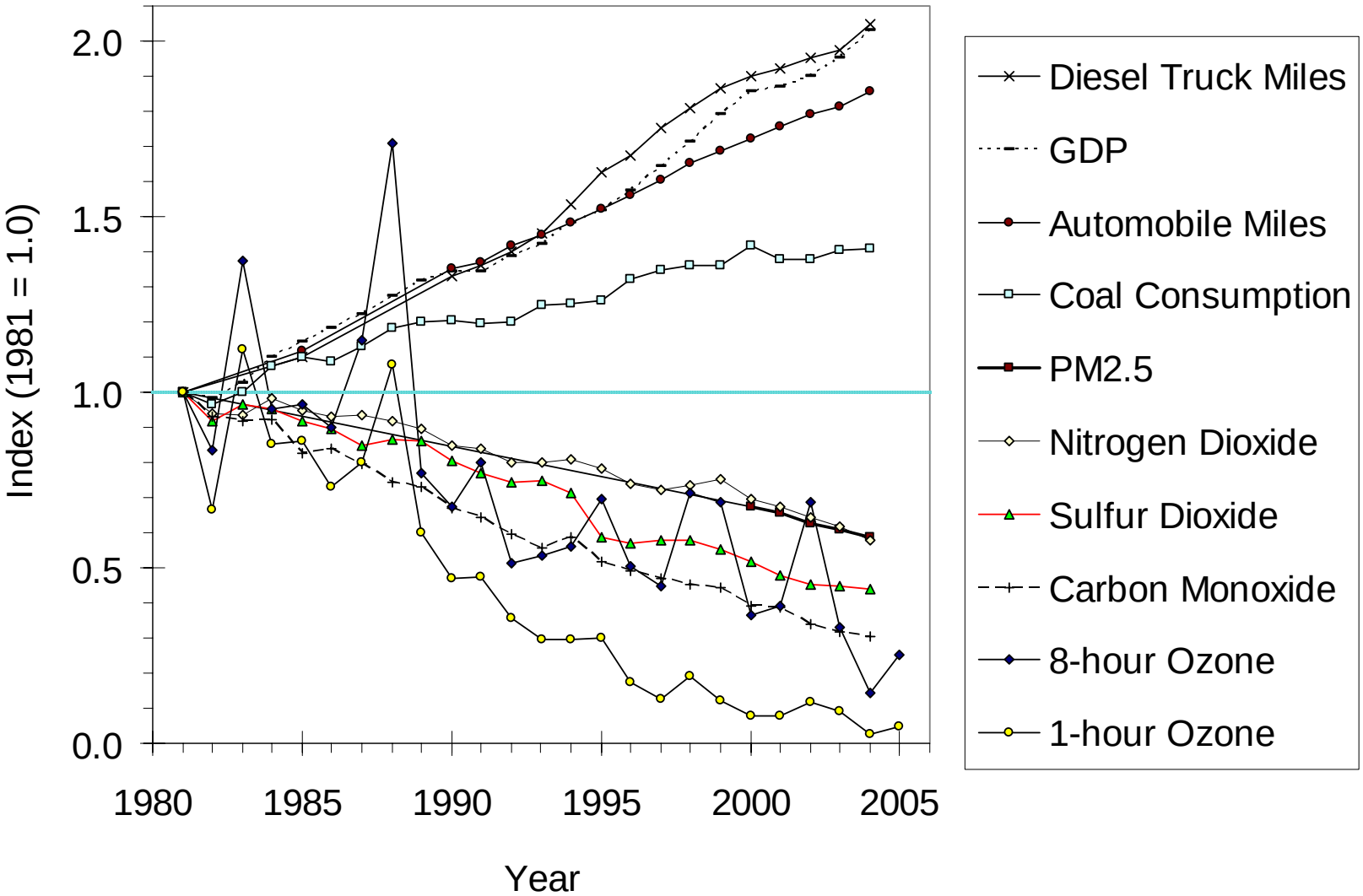
Overview

- Air pollution has been declining and will continue to decline. Already-adopted requirements will eliminate most remaining air pollution.
- Most Americans believe air pollution hasn't improved or is getting worse, and is still a serious and widespread health threat.
  - Why? Because trusted sources of environmental information exaggerate air pollution levels and health risks.
- Misperception of air pollution leads to counterproductive policies.

More Driving, More Energy…Less Pollution

National-average air pollution levels, 1981-2005

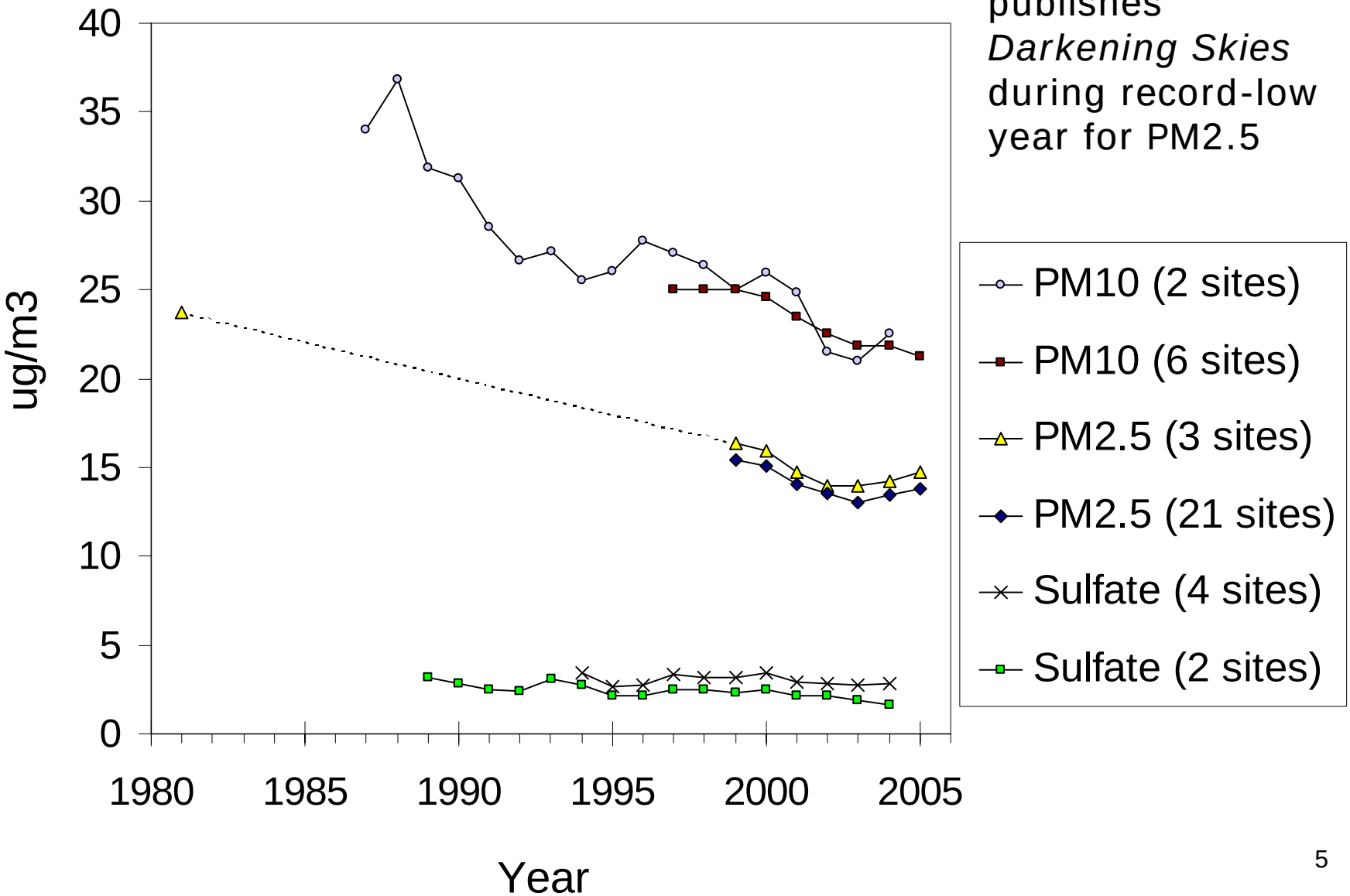


But you'd never know if from media and activist accounts

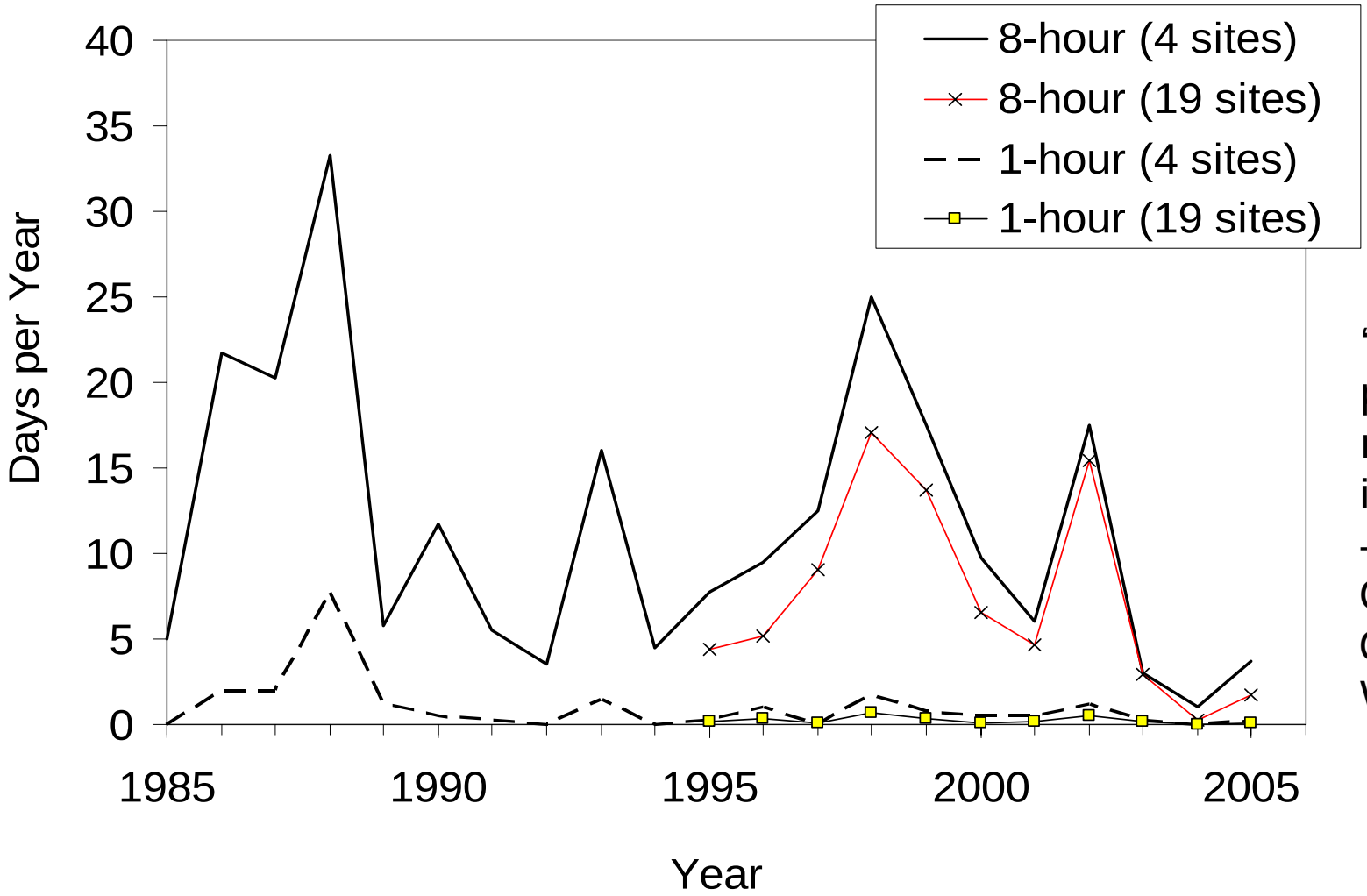
- "The Clean Air Act is seriously at risk" — American Lung Association, *State of the Air 2004*
- "Smog is out of control in almost all of our major cities" — Sierra Club, *Clearing the Air with Transit Spending*, 2001
- "More highways, More Pollution" — Title of Surface Transportation Policy Project report, 2004
- "Darkening Skies" — Title of Public Interest Research Group report, 2002
- "Sprawl and higher-emitting SUVs are proliferating faster than technological fixes can keep up." – David Goldberg, Smart-Growth America, *Atlanta Journal-Constitution*, 9/1/03
- "It might be a good idea to breathe now, while you still can" — Paul Krugman, *New York Times*, 11/26/02
- "EPA Plans Rollback of Clean Air Act" — *San Francisco Chronicle* front-page headline, 6/14/02
- "[President Bush] has spent the last two years rolling back laws and regulations that have long guarded the nation's air" — *New York Times* editorial, 1/31/03

NC PM Trends

2002: PIRG publishes *Darkening Skies* during record-low year for PM2.5

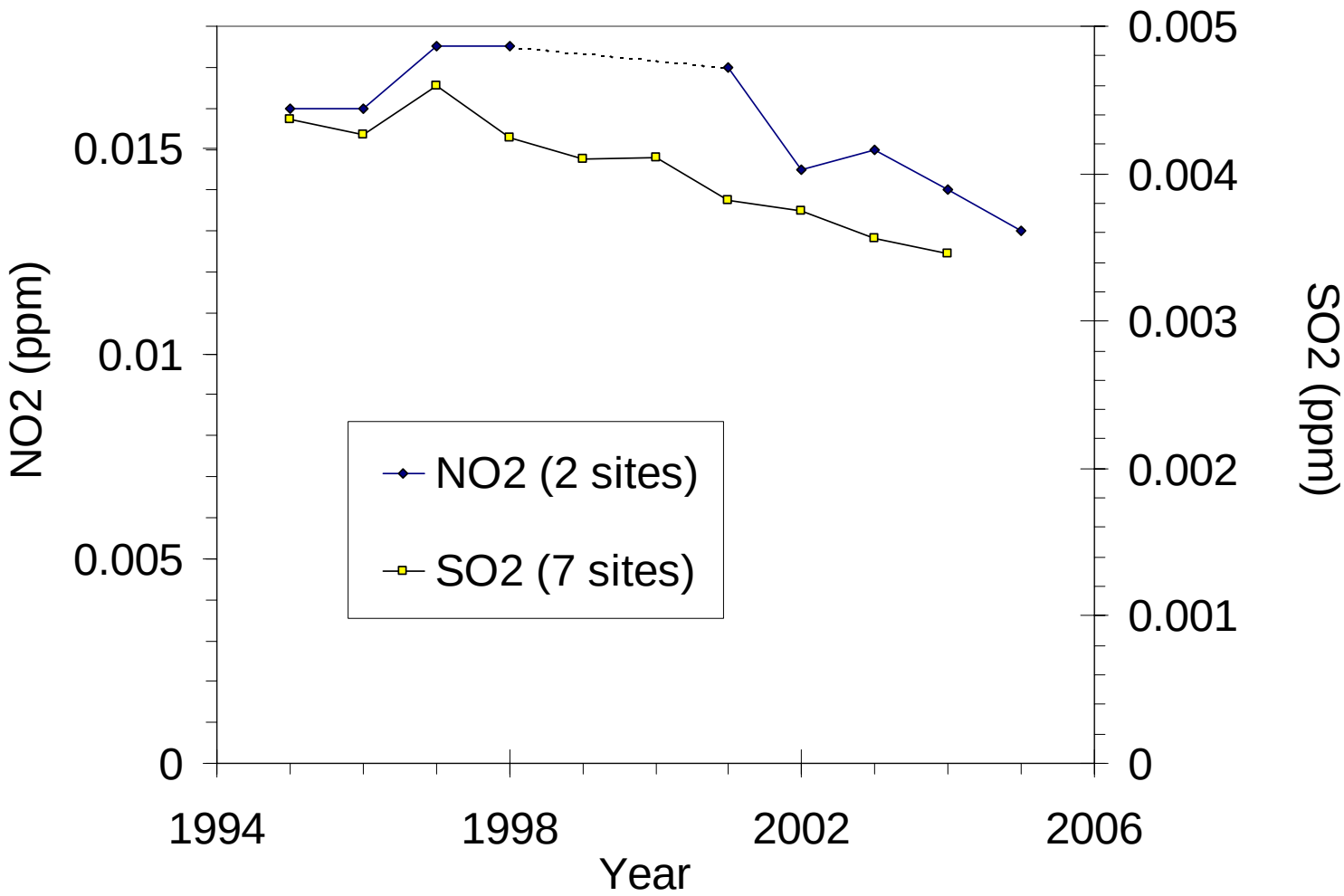


NC Ozone Trends



"Smog problems nearly double in 2005" –Frank O'Donnell, Clean Air Watch

NC SO2, NO2 trends



New York Times Magazine publishes "Changing all the rules" in April 2004, claiming that Bush administration policies are causing huge increases in power plant emissions

Emission trends

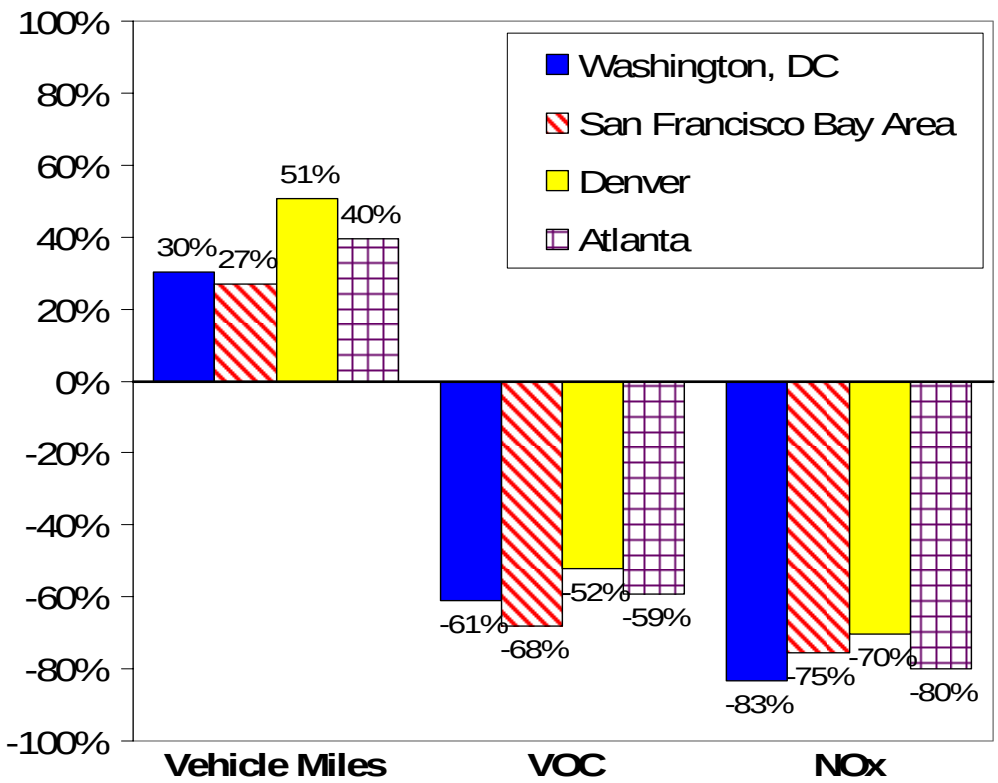
- No ambient trend data on volatile organic compounds, but…
  - On-road emission data show VOC emissions of average automobile (including cars, SUVs, pickups) are dropping about 12%/year
  - Ambient data on specific VOCs (e.g., benzene, 1,3-butadiene) show ongoing declines
- No data on ambient diesel PM specifically, but…
  - On-road data in Pennsylvania and California show 7%-9% per year decline in per-mile diesel soot emissions

Emissions will continue to decline

- Current requirements will eliminate most remaining PM- and ozone-forming emissions
  - During next 20 years: 90% reduction in per-mile emissions of NOx, VOC, diesel soot; >80% reduction after accounting for growth in driving.
    - Tier 2 light-duty; Tier IV non-road; HD truck stds.
  - Power plants: >30% reduction in NOx, SO2 since 1990. 60% reduction in ozone-season NOx from 1998-2004. CAIR eliminates most remaining SO2 and NOx missions.
  - MACT standards eliminate most industrial VOC and HAPs (hazardous air pollutants)
- Long-term problem of air pollution has already been solved

Regulators make a similar prediction, but they don't publicize it

- Look at conformity findings
  - Predict large decreases in VOC and NOx, despite large VMT increases
- All based on MOBILE6, which *underestimates* rate of automobile emissions decline
  - On-road data show MOBILE6 overestimates emissions of newer cars relative to older cars
  - Tier 2 requires lower emissions than MOBILE6 predicts
- Real improvements will be even greater than regulators predict

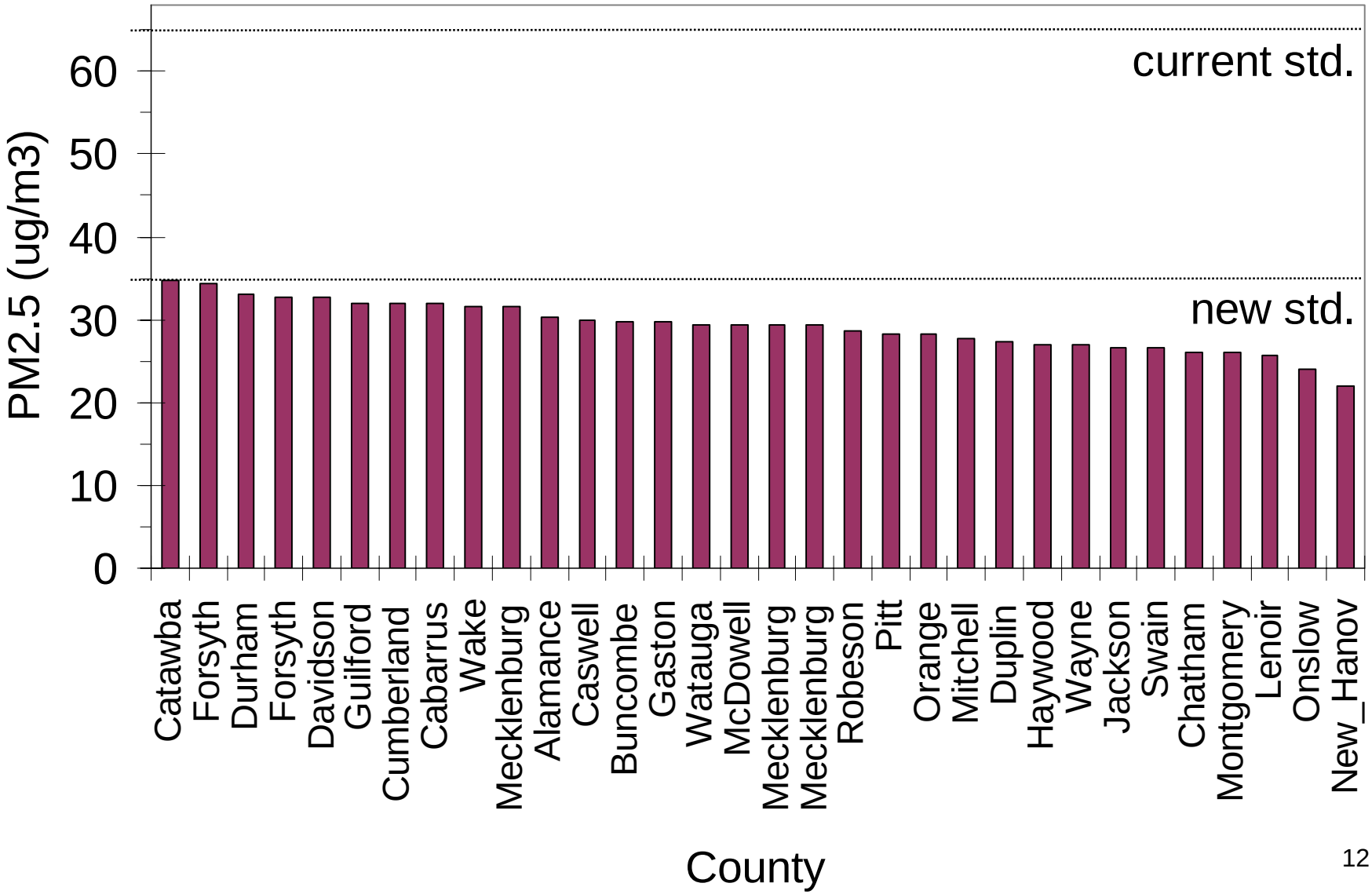


"Americans are driving more miles than they did in the 1980s. And they're driving vehicles that give off more pollution than the cars they drove in the '80s."
– *USA Today*, Oct. 16, 2003

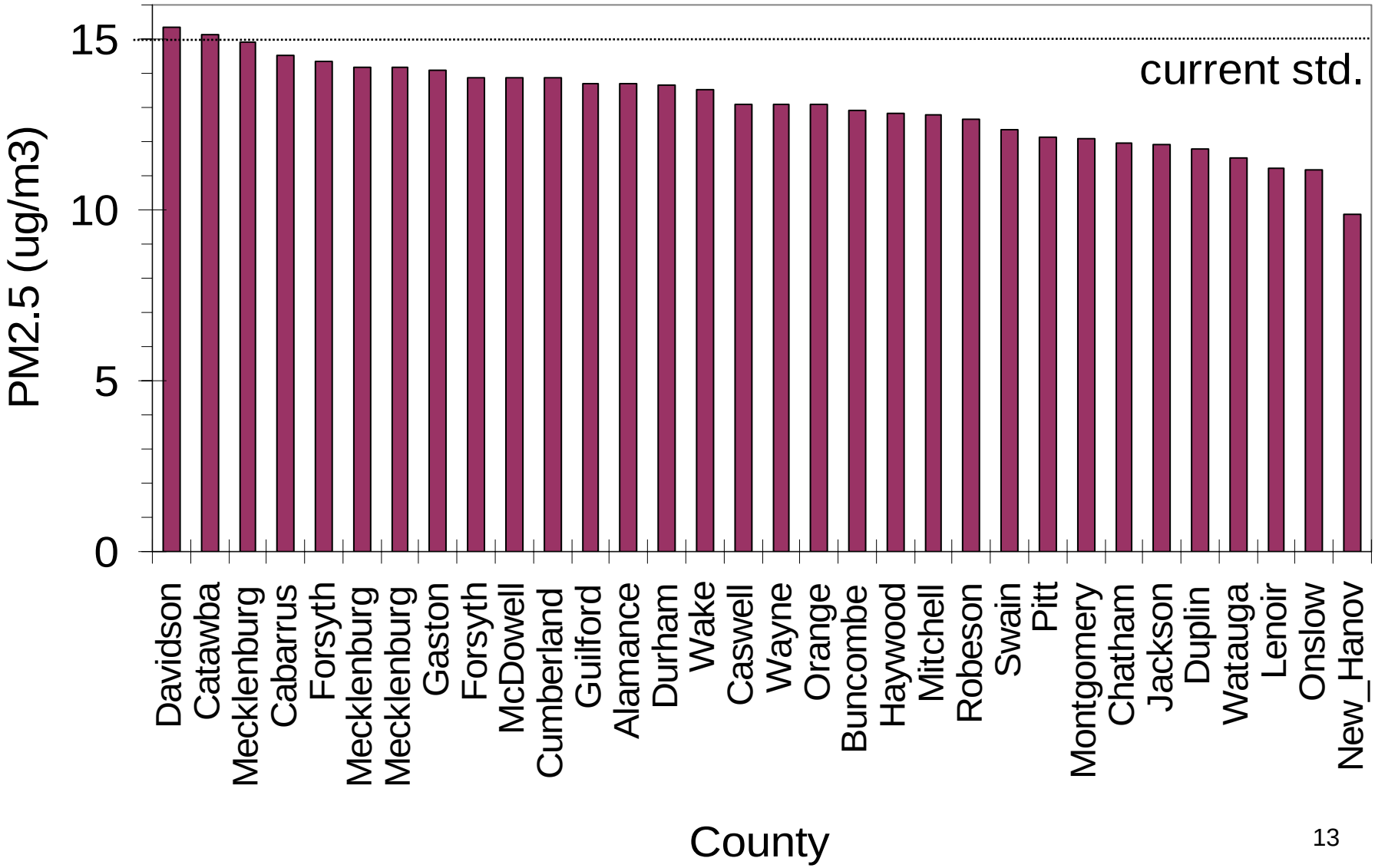
Air Pollution: Current Status

- Lowest 3-year ozone in history
  - 87% of monitors comply with 8-hour standard in 2005, compared with 25% in 2002
  - However,
    - Ozone can vary a great deal from year to year; no guarantee that ozone will stay as low as it has for the last 3 years.
    - NOx reductions are likely slowing progress on ozone.
    - EPA considering much tougher standards that would put most of state out of attainment.
- PM2.5 has risen slightly, but state is near full attainment
  - Not clear why PM2.5 has risen, as emissions have been dropping. Weather could be a factor.
  - PM-forming emissions will continue to decline.
  - State is near full attainment even based on proposed tougher standard.

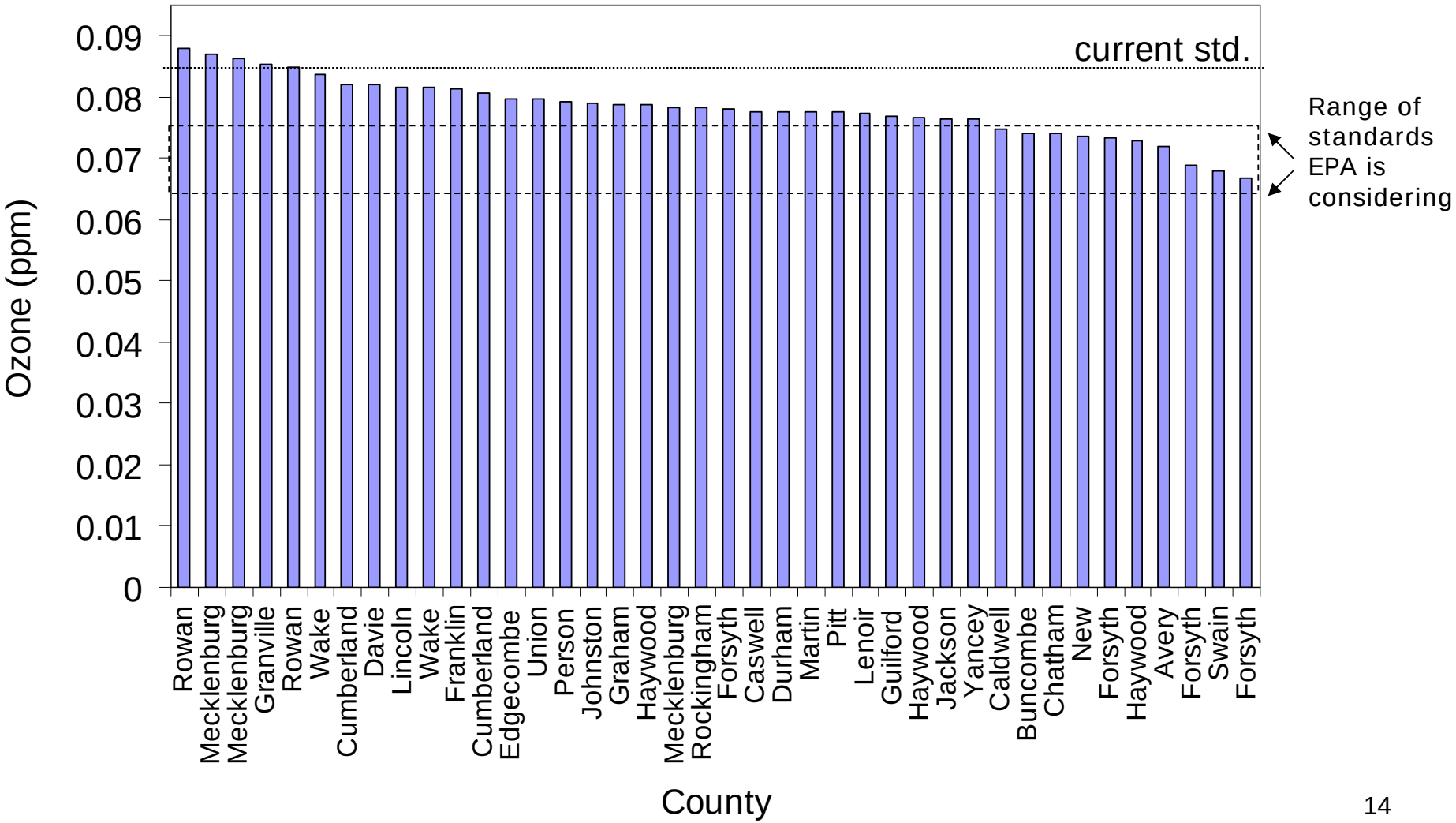
24-hour PM2.5, 2002-04



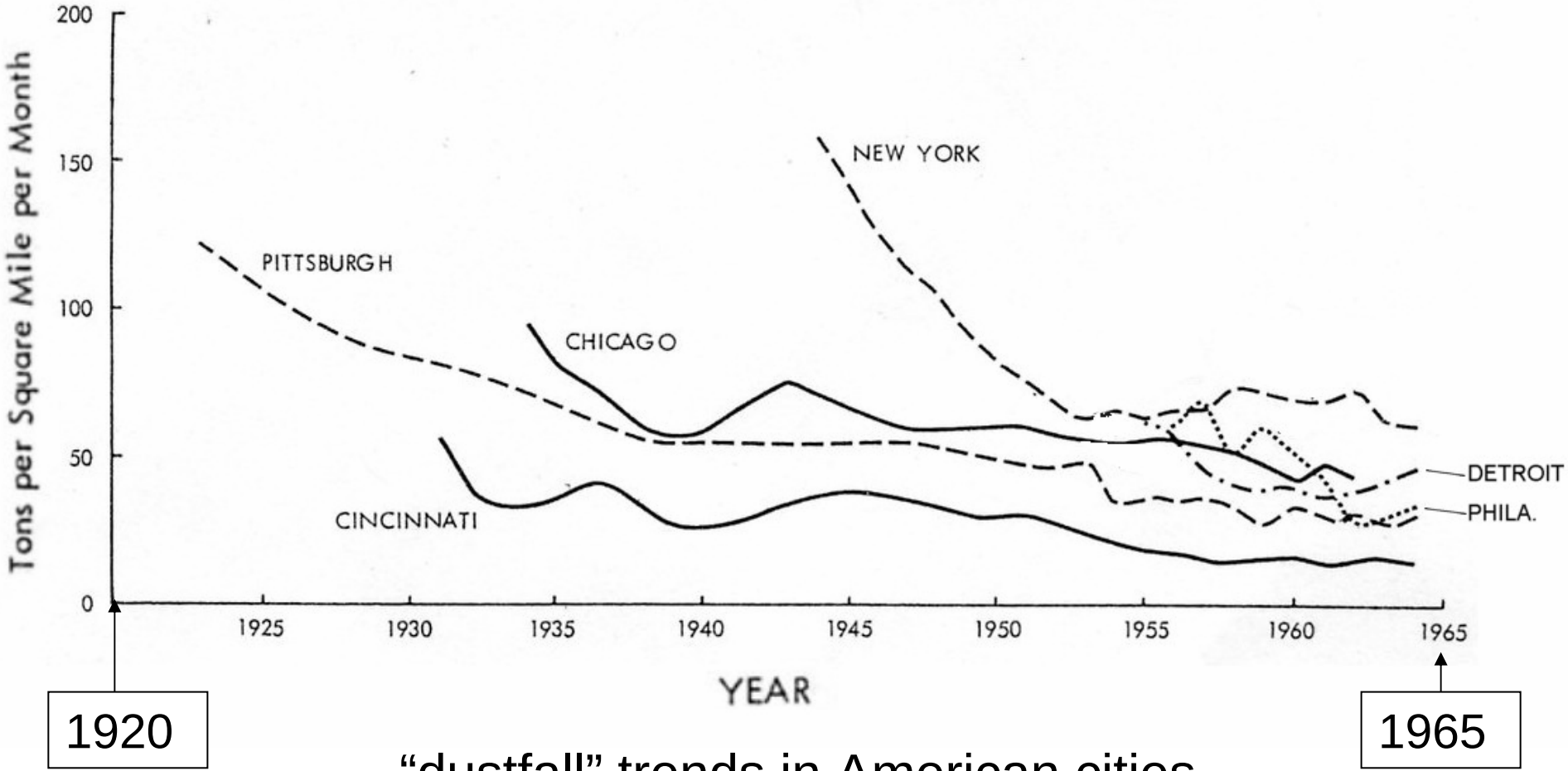
Annual PM2.5, 2002-04



8-hour ozone, 2003-2005



Pollution was On the Decline Long Before the Clean Air Act



"dustfall" trends in American cities

Despite large reductions in air pollution and the certainty of continued improvements, polls show Americans believe we've made little progress on air pollution, or even that air pollution has increased, and will increase in the future.

Why is so much of what Americans "know" about air pollution false?

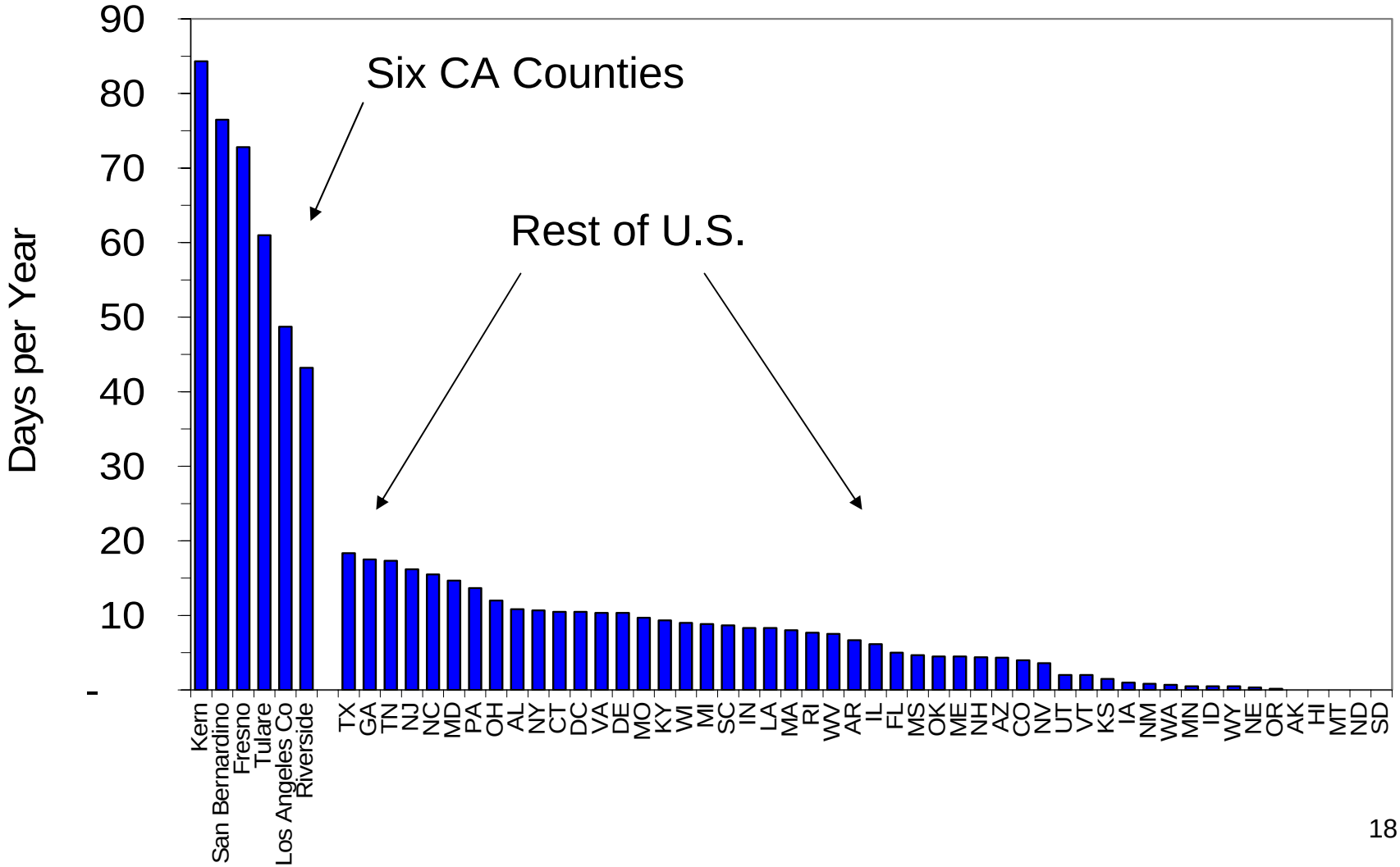
Activists, journalists, and regulators exaggerate air pollution levels and obscure positive trends

Does NC have the worst air pollution in the nation?

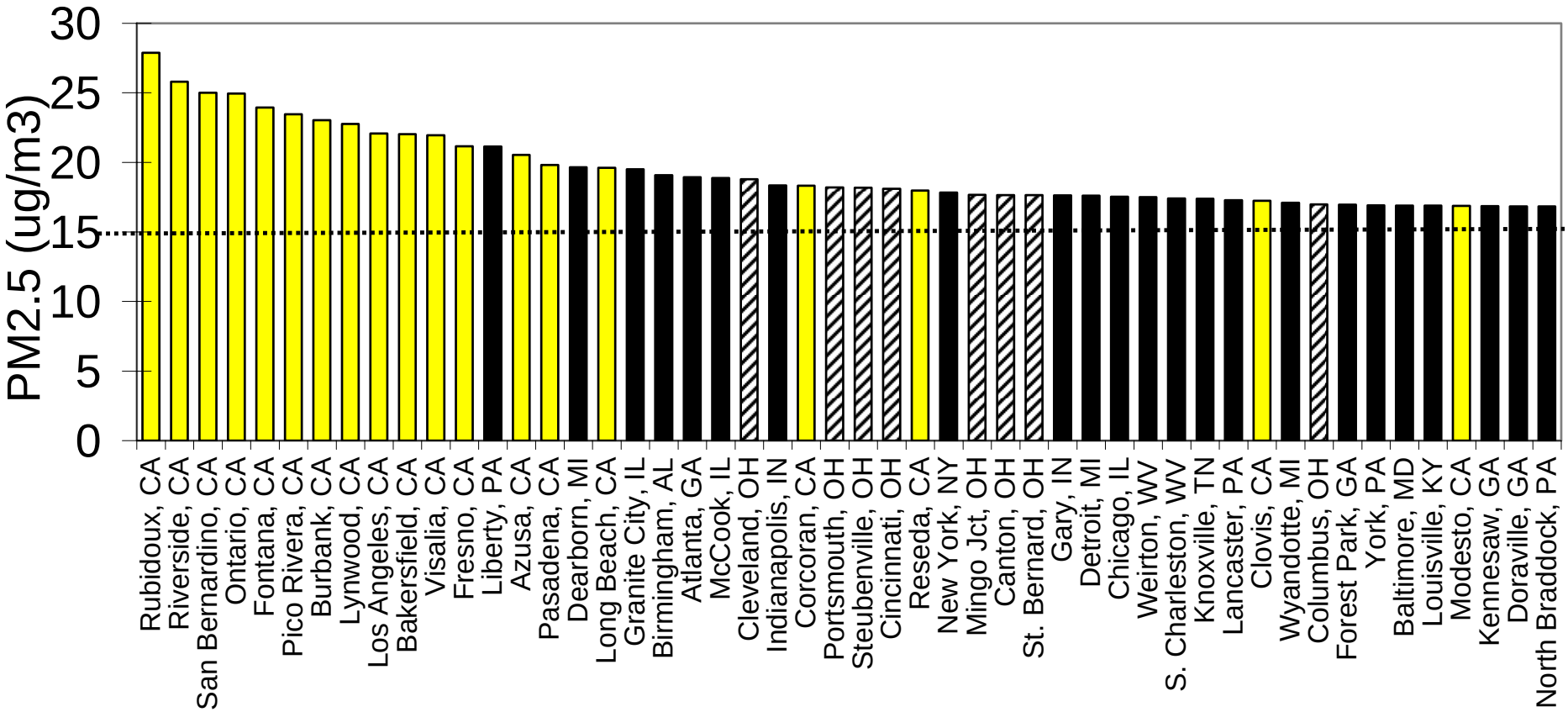
- "North Carolina has **some of the worst air pollution** in the country" -- North Carolina PIRG and *Ashville Citizen-Times*
- North Carolina has **some of the nation's worst air**" -- *Winston-Salem Journal*
- "the facts are clear—we have **some of the worst smog and ozone** levels in the nation" -- *Durham Herald-Sun*
- North Carolina is "cursed with **some of the worst air pollution** in the United States" -- *Greensboro News & Record*
- The Raleigh-Greensboro-Atlanta "megalopolis" has "**some of the worst air pollution in the country**" – *Raleigh News and Observer*
- The Great Smoky Mountain National Park "has been suffering from **some of the nation's worst air** pollution" – *Charlotte Observer*

Only California has “some of the worst air pollution in the nation”

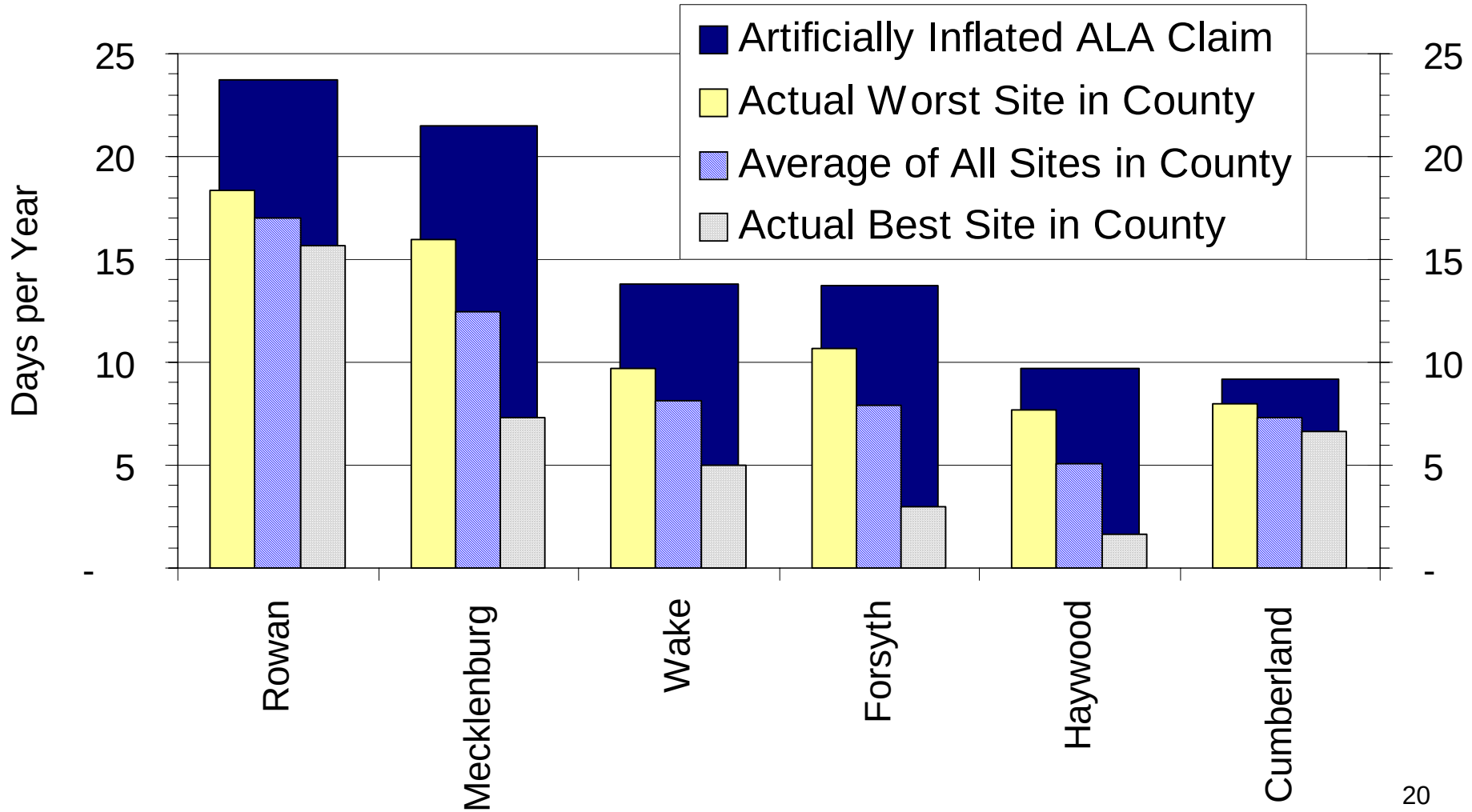
8-hour ozone exceedances, worst location in each county or state, 1999-2004



PM2.5 annual average, 2000-2003, worst 50 monitoring locations in U.S.



Actual 8-hour Ozone Exceedances vs. American Lung Association Claim (2000-02)



Air Pollution and Health

- Even without exaggerations, tens of millions of Americans live in areas that violate the federal 8-hour ozone and annual PM2.5 standards. What does this mean for people's health?

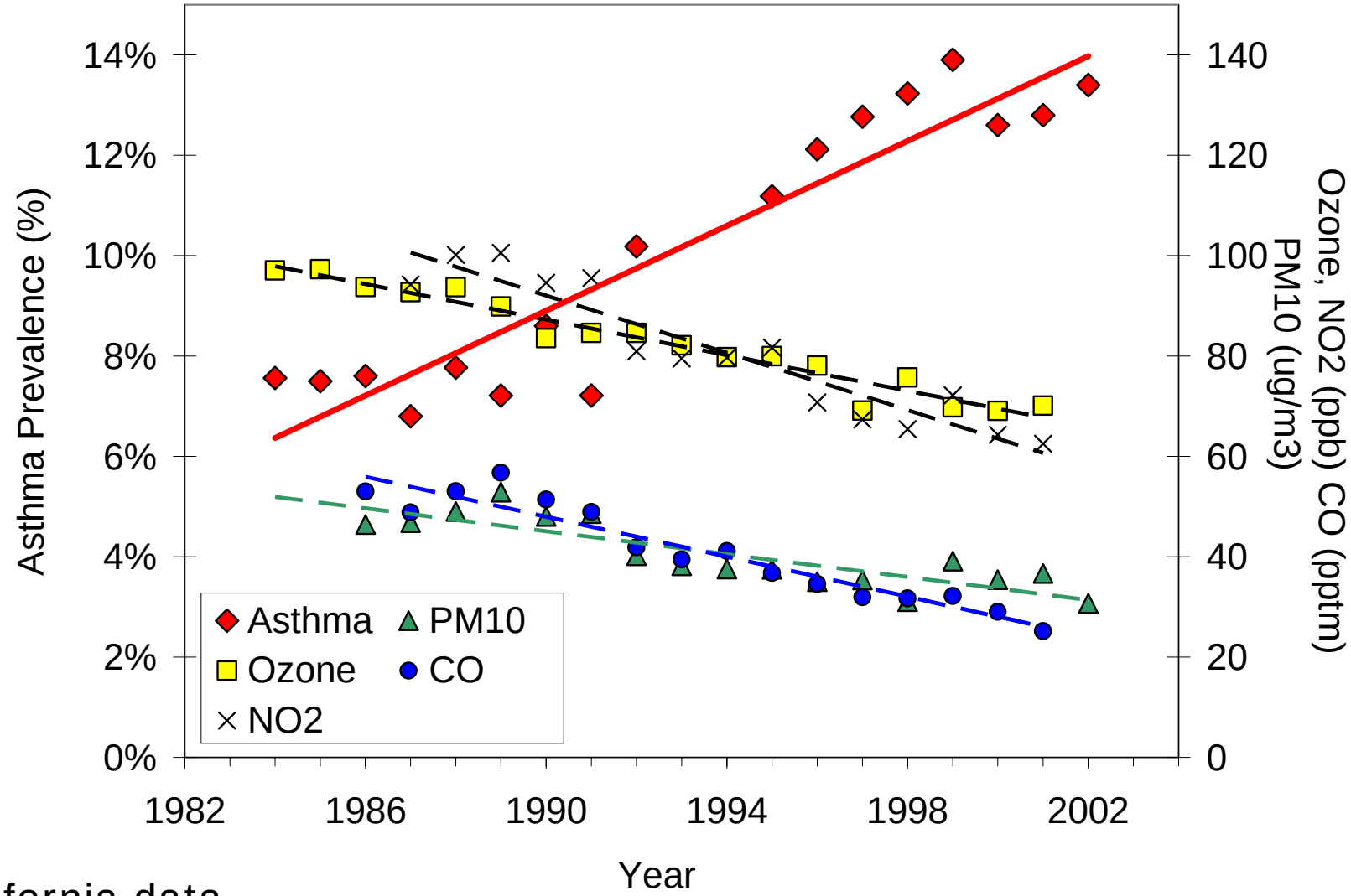
Even studies cited by activists and regulators suggest effects of air pollution are small

- Ozone, short-term: California Air Resources Board recently estimated that reducing CA ozone down to background levels would reduce respiratory hospital admissions by 1.2% and ER visits by child asthmatics by 1.8%. Reducing ozone to federal 8-hour standard would accrue about half these benefits.
- Ozone, long-term: California's Children's Health Study followed thousands of children in 12 communities with pollution ranging from background to the highest in the U.S.
  - Asthma incidence was 30% *lower* in the *highest ozone* communities and 20% *lower* in the *highest PM2.5* communities
  - Even in areas exceeding 1-hour ozone standard 60 or more days per year, ozone had no effect on children's lung capacity
  - PM2.5 had no association with lung capacity until PM2.5 level exceeded about 15 ug/m3. And even at worst location in U.S., lung capacity was only 2% lower than in lower-PM areas

Does particulate matter kill?

- Based on study EPA used to set annual PM2.5 standard…
  - PM kills men but not women; those with a HS education or less but not those with some college; the moderately active but not the very active or sedentary
  - Adding migration to statistical model eliminated PM association: suggests apparent PM effect really due to healthier people leaving areas that were in economic decline (i.e., Midwest “rustbelt” cities)
- Two more-recent studies found no PM-mortality association, including a study of veterans with high blood pressure
  - Not accounted for by EPA in setting PM2.5 standard; ignored environmental groups.
- Studies with human volunteers find no effects from sulfate and nitrate, two major components of PM2.5, even in people with respiratory disease and even at concentrations many times higher than ever occur in ambient air.
- PM2.5 does not kill animals, even at concentrations many times ambient.

Declining Air Pollution, Rising Asthma



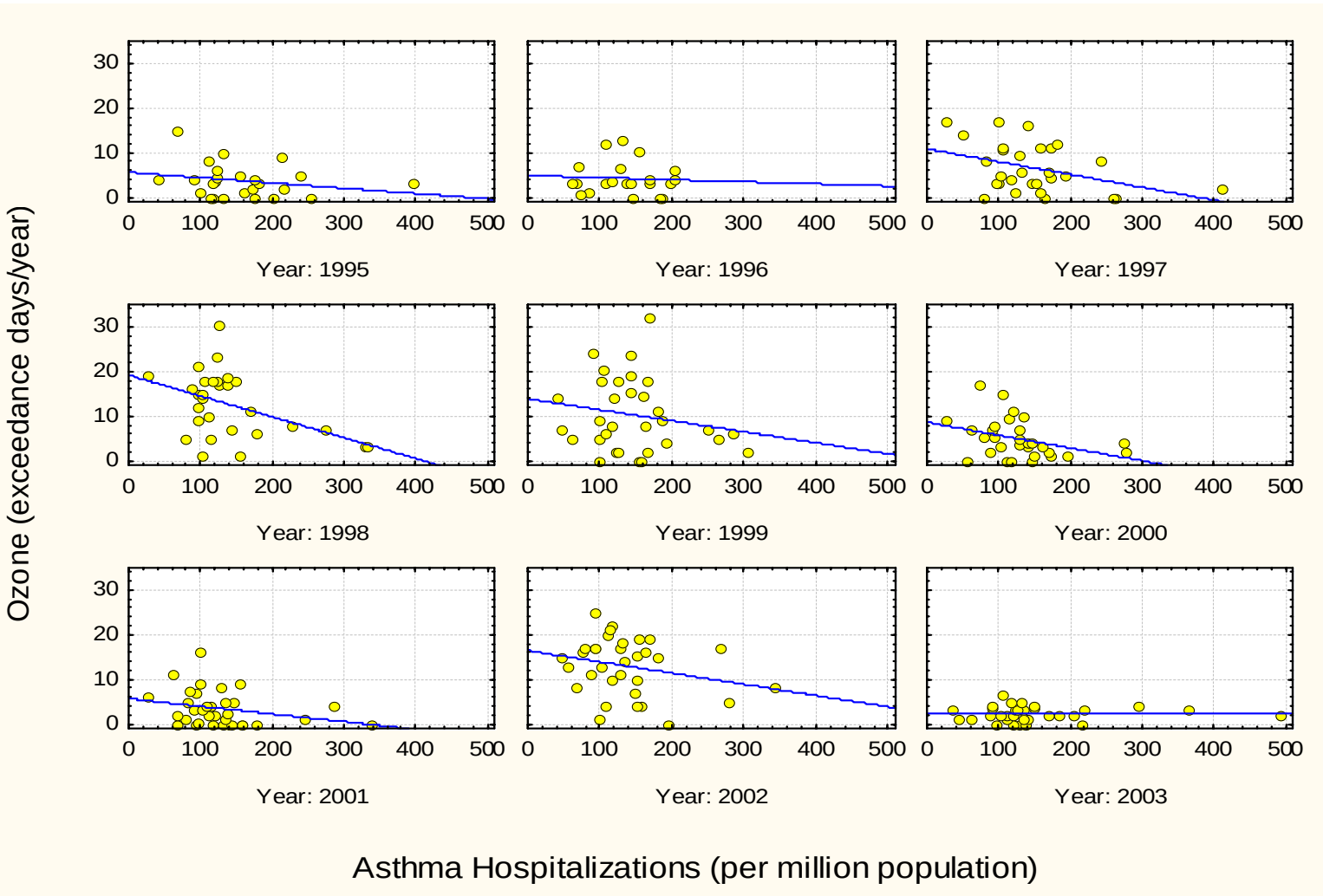
California data

Exacerbation of Respiratory Disease

- Air pollution can exacerbate respiratory diseases, but extent and magnitude of effect is relatively small
  - Even CARB predicted eliminating virtually all human-caused ozone would reduce respiratory hospital admissions by about 1.2%
- Asthma hospitalization rates are lowest in July and August—but this is when ozone is highest around the U.S., and when PM2.5 is highest in the eastern half of the U.S.

Higher ozone…lower asthma hospitalization rates

Asthma hospitalization rate versus ozone level for North Carolina counties



Why does air pollution seem so much worse than it actually is?

- Exaggeration
- Vague/misleading descriptions
- Omission of contrary evidence
- Repetition
- Regulators, activists, health scientists, and journalists are all part of the problem

Exaggeration (1)

- Exaggeration of (1) air pollution levels, (2) the number of people living in areas that violate air pollution standards, (3) the health effects of any given level of air pollution
- “Millions of people, of all ages and backgrounds, live in places where pollution in the air makes it difficult, even dangerous to breathe.” ALA, *State of the Air 2005*
- Journalists and activists repeated claims of having “some of the worst air pollution in the nation.”

Exaggeration (2)

- Children's Health Study, USC press release "By age 18, the lungs of many children who grow up in smoggy areas are underdeveloped and will likely never recover." What wasn't said or reported:
  - Ozone had no effect on lung development, even though study included areas with by far the highest ozone in the U.S.
  - PM2.5 associated with a 2% reduction in lung capacity in highest-PM2.5 area—a unique location in southern California with far higher PM2.5 than any other place in U.S.
  - USC doctor who authored study said: "When we began the study 10 years ago, we had no idea we would find effects on the lung this serious,"
- Regulators issue "code orange" and "code red" alerts when air pollution is predicted to exceed a standard on a given day, creating appearance of widespread and serious danger.

Vague/Misleading Descriptions (1)

- Children's Health Study, USC press release: "lungs of many children who grow up in smoggy areas are underdeveloped..."
  - "Smoggy areas" is never defined. Activists, regulators, and journalists cite the study as if it applies to any area that exceeds a pollution standard. But it applies only to PM2.5 levels during the 1990s in a small area of southern California that had uniquely high PM2.5 levels; and it doesn't apply to ozone at all.
  - PM2.5 effect was only a 2% average reduction in lung capacity in highest PM2.5 area (during the1990s), but this is never mentioned in the press release or even in the journal article that was published in the *New England Journal of Medicine*.

Vague/Misleading Descriptions (2)

- ALA summary of air pollution research: “Lung Development of Young Monkeys Drastically Changed when Exposed to Ozone Pollution…this study presents data suggesting that the changes caused by ozone pollution are long-lasting, and maybe even permanent.”
  - No mention that study used ozone levels several times higher than Americans have ever experienced. Even Los Angeles in the 1970s never reached ozone levels used in the study.
- Study of mice exposed to PM2.5, published in JAMA
  - Reported that PM2.5 increased atherosclerosis even at typical ambient levels
  - 7 of 10 news stories failed to note that the mice were genetically engineered to have cholesterol levels 14 times greater than normal mice, making the study irrelevant to real mice, much less people (only one-in-500 men has cholesterol greater than even twice the male average)
  - The scientists who performed the study also played down the unrealistic nature of the mice. An NIH press release claimed the mice were “genetically programmed to develop atherosclerosis at a higher-than-normal rate.” That’s like doing a study of people who weigh 500 pounds and referring to them merely as “overweight.”

Cherry-Picking (1)

- Regulators and activists cite only studies that find a pollution effect and ignore weaknesses and anomalous results from these studies.
  - ALA's "Medical Journal Watch" web site summarizes hundreds of air pollution health studies, but excludes research that doesn't find harm from air pollution.
- CARB/USC Children's Health Study: Scientists and regulators at press conference reported 3x increase in asthma in very active children living in high-ozone areas vs. low-ozone areas. But omitted 30% lower overall asthma rate in high-ozone areas and 20% lower asthma rate in high-PM and high-NO2 areas. Also failed to note that ozone levels, even in highest-ozone areas of country, had dropped below minimum effect level after study was completed.
- Veterans study found no PM2.5-mortality link, but study is ignored by activists and regulators, who cite only the ACS study.

Cherry-picking (2)

- Air pollution stories in California routinely highlight Fresno, which has high air pollution and highest childhood asthma rate in CA. But reporters and activists never mention that other high-pollution CA counties have low asthma rates and several low-pollution counties have high asthma rates
- CA Air Resources Board staff recently gave a presentation to the Board on a study that reported a PM2.5-mortality association in California (Jerrett et al. 2005), but have not presented the results of Enstrom (2005), which reported no PM2.5-mortality effect in California
- Cherry-picking makes the evidence seem more consistent and compelling than it really is.

Why Misleading Accounts of Air Pollution?

- Political support for ever more stringent regulation depends on maintaining a climate of fear and outrage
- Regulators' and activists' jobs, power, and prestige depend on perception that problem is serious, pervasive, far from being solved
  - Regulators are major funders of the health research used to justify their power and budgets. They choose the questions that get asked and who gets funded to ask them.
- Scientists who choose a career in air pollution health research are probably more likely to hold an environmentalist ideology and to believe that air pollution is a serious problem.
  - Many air pollution health researchers have explicitly associated themselves with environmental groups and causes.
- Tunnel vision is endemic to single-purpose organizations
  - pursuit of a single-minded goal to the point where it does more harm than good
- Air pollution as a means to pursue a social agenda for how people "ought" to live
- Good news doesn't sell newspapers

What's Wrong with Air Pollution Alarmism?

- Excessive resources devoted to an exaggerated risk means fewer resources for everything else—other genuinely larger risks and other needs and desires such as food, housing, education, leisure, health care, etc.
- Unnecessary fear
- Real world: many aspirations, many risks… but scarce resources
  - Consumers ultimately pay regulatory costs through higher prices for useful goods and services
    - Regulation will do net good only if it confers benefits greater than the harm from its income-reducing costs
  - Air pollution regulatory costs are probably also regressive
    - But costs are safely hidden, so proponents need not come to terms with the harm this causes
- Public's interest is in accurate portrayal of risk—only way to make informed choices on air pollution reductions vs. other public and private priorities