

State/Local Legislative and Regulatory Role

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I am representing the State and Territorial Air Pollution Control Administrators, more commonly known as the State Air Directors.

I also have a number of other hats. One is as a state director from the state of Vermont, whose program ended up with an ambient sulfate standard in the early 1980s, trying to get the Federal Government to enforce it as part of our state implementation plan, but that didn't quite work.

Also, I have been the co-chair of the acid rain steering committee of the New England Governor's committee for years. As I talk, I am trying to represent the states. At the same time, I will tend to give some regional examples.

I want to thank the organizers for holding this conference. I think it is important. We really are seeing a lot of changes in science over the last 10 years. To get everybody together to focus is, I think, a great opportunity.

The task was to talk about what states have been doing for the last 20 years. I think that the states ended up with a patchwork of acid rain control programs throughout the country. Since the 1990s and the Clean Air Act, most of those programs have disappeared.

I took a little poetic license and went back a little further than 20 years, and really want to focus on what are the lessons that we learned as state air agencies.

In the early aspects of air pollution, we had command and control. In the 1960s and 1970s, we ended up where we were responding to catastrophes and going after the most obvious sources.

At the same time, during the 1960s and 1970s, we ended up doing a lot of controls on sulfur dioxide. We started to lower sulfur dioxide in fuels. We ended up where there was, at least in the northeast, a lot of change of fuels from coal to oil.

The regulatory programs were typically focused on controlling the largest, most obvious and most cost effective sources, unless they were old, uncontrolled and near retirement. That was 25 years ago. We grandfathered those plants, and we need to look at them again.

The other thing that we, as state air officials want to do, is get rid of these fine particulates, so you won't have these brilliant sunsets.

Acid rain is more subtle in its effects (Figure 1). As Dr. McLean said, early efforts focused not on the severity and causes of problems, but how much was it going to cost. In this city, in Washington, D.C., it seemed that the debate turned all in one week from, prove it is a problem, to how much is it going to cost to solve the problem. It was in a week that both National Geographic and Sports Illustrated ran stories on acid rain and showed fish belly up. You can talk about people dying, but seeing fish bellied up was more of an incentive in dealing with the issue.

Early Air Pollution Control Laws were based on Command & Control, with Strict Enforcement

- 1273 - King Edward I Bans burning of soft coal in London
- 1307 - Blacksmith convicted & hanged for violating law



But over time, this approach proved to be politically unpopular...

Regulatory Programs have typically focused on Controlling the Largest, Most Obvious, Most Cost-Effective Sources



SESSION I. Addressing the Acid Rain Problem - Twenty Years in Retrospect

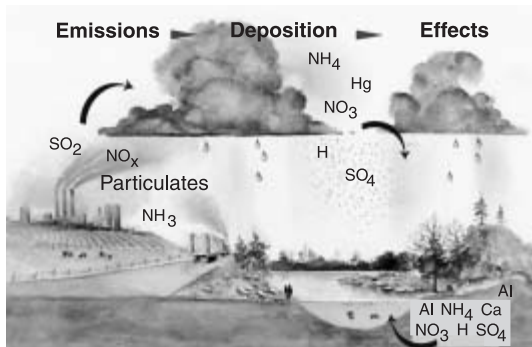


Figure 1. Acid rain is a more subtle catastrophe with more complex sources and effects.

I always remember one phrase which is, *public demand is the only thing which changes public policy*. There was a real shift in the debate during that one week.

You can see what the estimates were back in 1989 (Figure 2). It is, in fact, the actual cost.

There is good news in sulfur (Figure 3 and 4). Sulfur deposition rates have declined since 1990 and the Clean Air Act, and we have seen chemical improvements in some lakes. On the other hand, there are a number of lakes in which we haven't seen chemical improvement and we have not seen biological recovery.

The 10 years have also shown how important the issue of nitrogen is. Nitrogen was not the focus of the Clean Air Act, although there are some requirements for reductions, but we have seen no improvements in nitrogen deposition, and it is a growing concern (Figure 5 and 6). What we are finding out from the research is that there is a

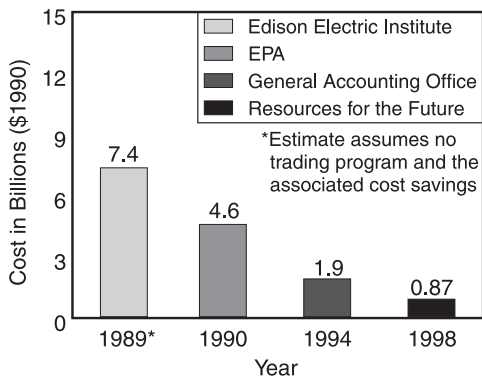


Figure 2. Estimated costs of Clean Air Act Acid Rain Controls.

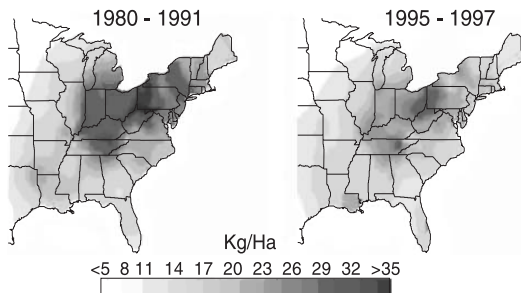


Figure 3. Wet sulfate deposition.

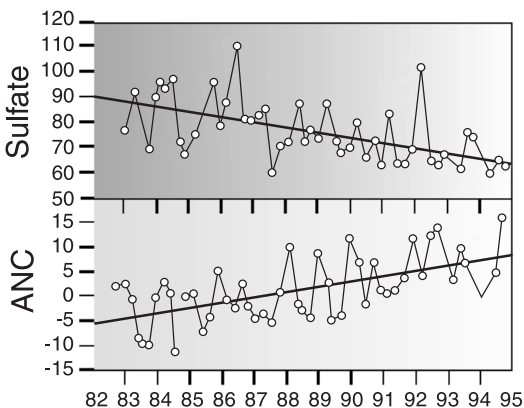


Figure 4. Trends in SO₄ and ANC at Bourn Pond, VT.

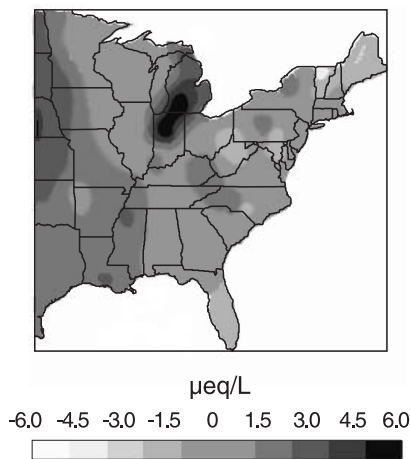


Figure 5. Changes in NO₃ concentrations in precipitation 1989-91 to 1995-97. No Improvement has been seen in nitrate deposition – there is growing concern that N can be a cause of episodic acidification of sensitive surface waters, chronic acidification in areas with N-saturated soils, and eutrophication of coastal estuaries.



Figure 6. Chesapeake Bay watershed and airshed for nitrogen deposition.

build up of nitrogen in the snow pack, and with the controls that are forecast this will continue and we have a shock in the spring run off.

We are also seeing chronic acidification in areas with nitrogen-saturated soils. I know that Guy Fenech from Environment Canada will be talking of dealing with some of the forest issues, but this is, in fact, having a major impact on coastal areas.

The forest issue is one that we didn't recognize 20 years ago (Figure 7). Even though we are having decreases in deposition rates, the sulfuric and nitric acid has a tendency to accelerate the loss of critical nutrients from sensitive forest soils. This is preventing the nutrients from reaching the tree. The results are lower production rates.

Really, our soils are a trust fund in terms of forest productivity. We don't know how much of

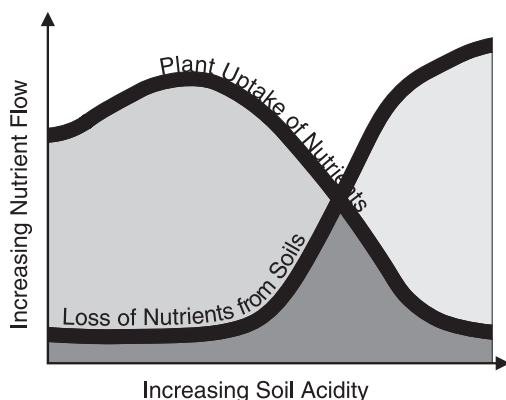


Figure 7. Even as deposition rates decrease, continued deposition of sulfuric & nitric acids accelerates loss of critical nutrients (Ca, Mg, K) from sensitive forest soils in the northeastern US and Canada.

the principal has been used. It is important that we look at it that way, especially in the forest-rich areas. Besides, we are going to need those for CO₂ offsets in the future.

Although we have had reductions in sulfates, we still have major problems when it comes to visibility in the northeast.

What are some of the lessons that we learned from the experiment? We have learned a lot over the last 20 years (Figure 8).

One is that the sulfur concentrations and depositions respond directly and are linear. The more we reduce the sulfur, the more we can reduce the impact in terms of acid impacts. We have also learned the nitrogen reacts the same way. Since we have no controls, we are not experiencing any reductions. We need large additional reductions in both sulfur and nitrogen oxides. They are needed to assure that we do have recovery.

In 1998, the governors and premiers signed an agreement, an acid rain action plan that called for an additional 50 percent reduction in SO₂ emission and a 30 percent reduction in NO_x emissions over the commitments that had been made in the Clean Air Act, the SIP Calls and whatever.

Even though it was more of a guesstimate as to where it should be going, they felt that it was at least directionally correct. We are finding that the science is justifying those numbers.

The other thing is that there are ancillary benefits in a lot of other areas, such as regional

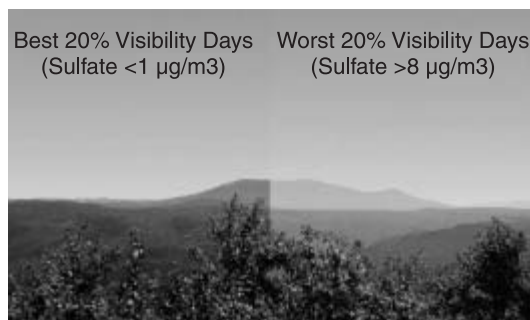


Figure 8. Effects of sulfate on visibility. While sulfate aerosol levels have improved, sulfate still accounts for 2/3 of the visibility impairment in the Northeast, including Class I areas like Vermont's Lye Brook Wilderness Area.

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haze, the sulfates, the acid aerosols, the fine particulates and ozone. There has been widespread benefit from the market system. Although I am not crazy about the market system in a lot of ways, it has pushed forward in dealing with control issues. Although I am as skeptical as other people as far as where these reductions are occurring, I think that in a full evaluation, this is a program that has worked and worked well.

One of the options is that, since we have a \$4 billion cost savings, in terms of projections to actual costs, that it is like those emissions were on sale. I don't know about you, but we should be able to take that money and put it back into the program. I think it is something that we should focus on, let's spend that money that was on sale.

We need to include reductions of both sulfur and nitrogen oxides and continue to seek the most cost effective emission reductions. At the same time – and I realize this is an acid rain conference – at the same time, we have to look at the other pollutants. We need to come up with a multi-pollutant bill to deal with these issues.

I am going to invent a word here. The Clean Air Act has been too model-pollutant-centric.

We end up where we start, dealing with one issue. Focus on that, put the controls on that, and then move on to the next. I don't think that this helps the environment and I don't think it helps industry in terms of planning for the future, and the power industry needs a long planning horizon.

We really need to take a holistic approach in looking at this issue, and try to come up with the

control systems that do the best benefit in terms of reducing the pollutants, all of them at some level.

Talking about states and acid rain programs 10 years ago, we are going through the same thing right now as far as state programs dealing with multiple pollutants. A lot of them start in the northeast, mainly because we want to have clean hands and we have a smaller number of power plants than they have in other parts of the country.

There are a number of programs that have been announced and are in the process of going through regulations in Massachusetts, New York, New Hampshire and Connecticut.

Massachusetts' recent announcement indicated that they were using a four-pollutant approach, looking at controlling carbon dioxide from their power plants.

Trading programs. If we have a patchwork of state programs out there with trading or have different values on what the trade is worth, we are never going to have a trading program that works.

I shouldn't be saying this talking for the states because, of course, all governors love flexibility. In this case, if we are going to make a trading program work, we need a national trading program to deal with these issues.

In conclusion, we do understand what the problems are, the sources and the most effective way to deal with them.

We need to work with industry to come up with solutions. If all else fails, we will have to – and we will do it state by state--go back to command and control. Thank you.