

Doing something about Acid Rain

Thousands of Canadian lakes can no longer support any plant or animal life.

This week's feature was submitted by Justin Manasc, a concerned forester and spokesman for the Conservation Council of New Brunswick.

Air pollution is one of the unfortunate byproducts of our technological progress. Its damaging effects on the environment are among the prices that we are paying for the luxuries of cheap and abundant energy, independent transportation and a generally high standard of living. To the extent that all of us expect these things, all of us are responsible for Acid Rain.

For all its catchiness, the phrase "Acid Rain" is somewhat of a misnomer. The problem lies chiefly with two pollutants: Sulfur Dioxide (SO₂), which is mostly emitted by coal and oil furnaces and boilers, and oxides of nitrogen (NO₂) which are produced by motor vehicles, power-plants and other oil-burning industries. These gases react with oxygen in the atmosphere, and may be deposited in dry form as sulfate or nitrate aerosols. These may be absorbed directly by plants or react with water on plant surfaces, lakes, streams and soil and form dilute sulfuric and nitric acids. If pollutants are transported for a longer time in the air, they are more likely to come in contact with atmospheric moisture droplets and undergo the same reactions, forming dilute acids which may eventually be deposited on earth as rain, snow, fog or mist....So acid rain is only part of the problem! To complicate matters, nitrogen oxides readily release oxygen molecules, and in the presence of the sun's rays, this free oxygen may react with gaseous oxygen to form ozone or with hydrocarbons to form peroxy acetylene nitrates and other photochemical oxidants. These secondary pollutants are known to be extremely toxic to both plants and animals. Finally another group of toxic pollutants, the heavy metals (lead, zinc) are also released by many of the same industrial and motor vehicle sources as are the acid-forming pollutants. All of these pollutants act, either separately or in combination, to cause important changes in the natural environment.

ECOLOGICAL IMPACTS

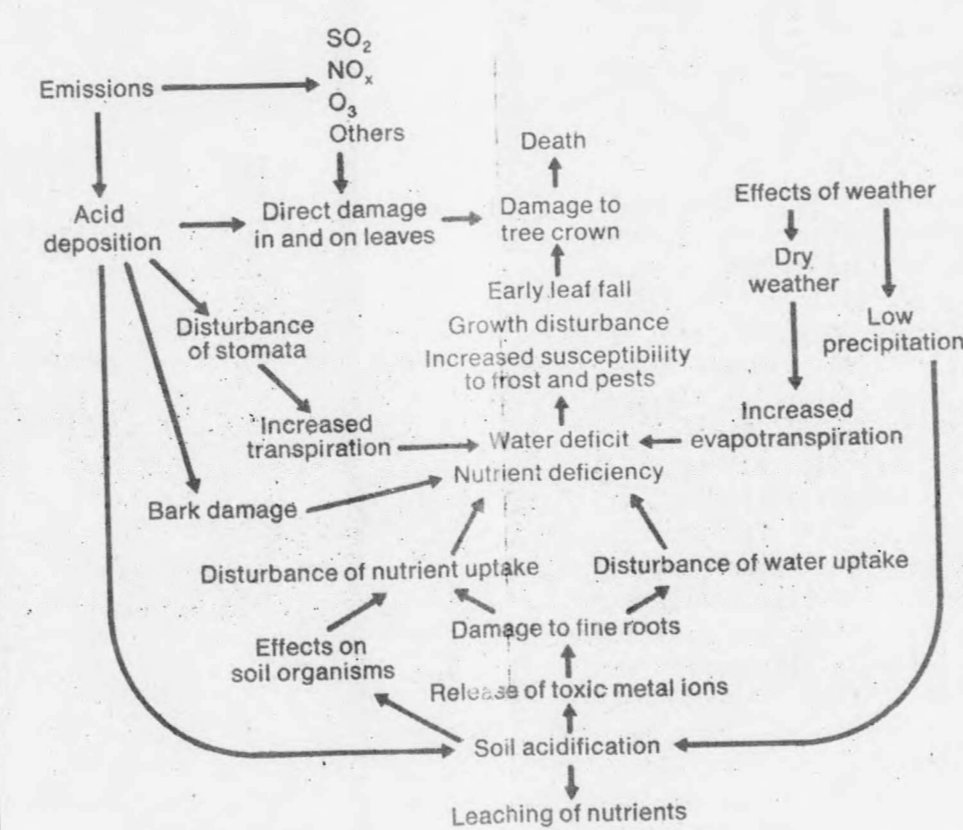
In Central Europe, where industry, cars and people are much more densely distributed than in North America, the forests have been dying at an alarming rate in recent years. Similar situations are also reported in parts of Scandinavia, and in high elevation regions of the eastern U.S.

The effects of Acid deposition on lake eco-systems has been documented even closer to home. By now we have all heard of the thousands of lakes in Northern Ontario which no longer support any plant or animal life. Similar cases now exist in other susceptible areas throughout the industrialized world.

The effects of air pollution on land and water eco-systems are not totally understood. Intensive research programs are currently underway in Canada, the U.S., West Germany and Scandinavia. Out of these are gradually emerging important insights into the functioning of organisms, their complex interactions with one another and with the environment. As in the case of cancer research, huge doors of

new knowledge have been opened by these investigations but the central concern or cure to the problem remains unresolved. There are still large gaps in our understanding and the push for further research should continue. Many theories have been proposed to explain the decline in Forest tree growth, these include soil aluminum toxicity to roots, stress due to acidity. If anyone is aware of this, it is the scientists themselves. The conclusive proof notwithstanding, the consensus in the scientific community has for several years been that the existing body of evidence clearly implicates SO₂ and NO₂ pollution as the primary cause. There is much we do not know about acid rain but we do know far too much to justify inaction any longer.

Air pollutants may damage trees in many ways



Source: Swedish University of Agricultural Sciences

THE COSTS

Because of the basic dependence on natural resource for a way of life, we find ourselves increasingly realizing the implications of environmental damage in terms of dollars and cents. Thus the disasters of acid rain are not all environmental;

*the three major sectors most seriously threatened by Acid Rain in Canada are sport fishing, tourism and forest products. These generate 8% of Canada's G.N.P.

*In Ontario 20 to 50% of the sports and commercial fishery, valued at \$260 million a year, will be lost within 10 to 20 years.

*The country's largest sector forestry is valued at \$23 billion annually and employs, directly or indirectly one million people. Although symptoms of forest damage are not yet widespread in Canada, the supply of wood to pulp and paper and lumber mills is already insufficient to sustain the present industry in many parts of the country, so even small losses in forest productivity can be ill-afforded.

*The National Academy of Sciences has stated that continued emissions of SO₂ or NO₂ at current accelerated rates pose a serious hazard to human health. In Ontario, it estimated in 1984 that medical care for cases of respiratory ailments related to SO₂ and NO₂ is costing \$80 million annually.

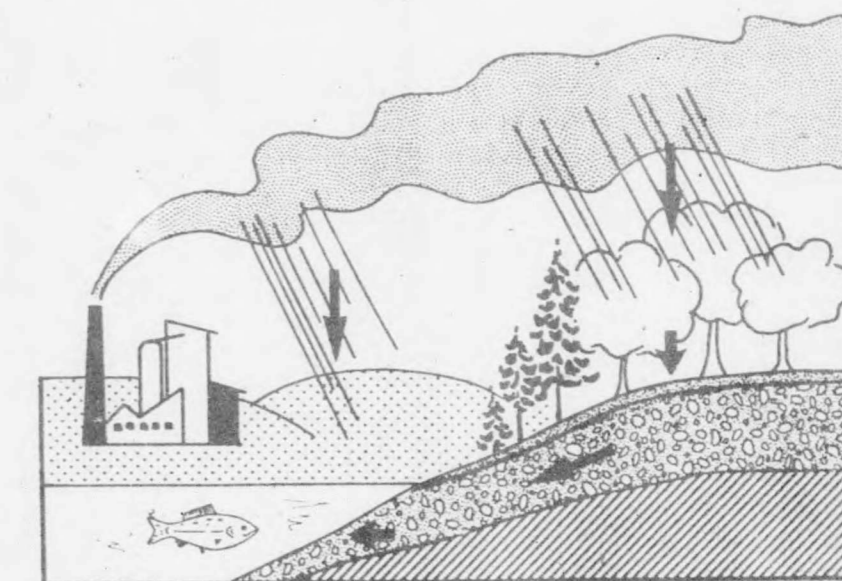
ACID RAIN POLITICS

It is hard to put these immense costs into perspective, but one thing seems clear, using the sky for a garbage dump is proving to be an expensive practice. There is a growing consensus that something must be done, and quickly. Governments and industry have been slow to respond and slower still to act.

The installation of emissions — reduction technologies on cars, smelters and utilities is effective in reducing NO_x and SO₂ but it is also very expensive. Our Canadian government has shown more of a flair for P.R. than guts. They have been hesitant to impose and enforce controls which industries say they can't afford, or to levy increased taxes from citizens to help pay for the controls. Sacrifices must be made. There is some promise in the recent agreement between the environment ministers of the six eastern provinces and the federal minister of environment to legislate and help fund a 50% reduction in national SO₂ emissions. However, specifics of who will pay for what has not been spelled out, and a similar agreement which was struck under the liberals a year ago has resulted in little change. For its part in the current agreement New Brunswick nominally agreed to a decrease of SO₂ emissions of 15% compared to 1980 levels, but this was already achieved by 1983, so, who are we fooling?

Perhaps the worst news for Canadians is that air pollutants have as yet shown little respect for political boundaries and the prevailing winds from the South and Southwest in this part of the world make this an international problem. U.S. sources presently produce 50% of the SO₂ deposited in Canada. The unwillingness of the U.S. of the U.S. government to co-operate by implementing similar SO₂ reduction programs to ours, means that even a 50% reduction in Canada's emissions will have a relatively small impact on reducing acid deposition in many of our eastern regions. Reagan has stalled action, first, by denying that the problem exists and then by claiming that we don't yet have sufficient understanding of causes and effects to justify the huge expenditures involved in reduction programs. So what can be done? What can you do? What can I do?

First of all, as a society, we must let our politicians know that we unequivocally support reduction measures for both SO₂ and NO₂ emissions to the extent that we are willing to pay for them. In 1984 it was estimated that the direct cost of controlling SO₂ emissions in Canada was \$1 billion or \$40 for each Canadian. It will never get any cheaper, so we



should set a credible example now and clean up our own collective back yard. Let our elected representatives know that Canadians take the problem seriously. There job is to listen: So write!

Hon. Suzanne Blais-Grenier
Environment Minister
House of Commons, Ottawa
K1A 0A5

Premier Richard Hatfield
Legislative Building
Queen Street, Fredericton, N.B.

Apart from writing and phoning there other things each of us can do to reduce damagin emissions.

- »»»use car pools
- »»»use public mass transit
- »»»install catalytic converters
- »»»use lead-free gas
- »»»heat homes efficiently
- »»»conserve electricity
- »»»recycle resources
- »»»encourage the development of safe, alternative resources like solar energy
- »»»get involved: For example the Conservation Council of New Brunswick is an active lobby group and educational facility. 180 St. John Street, Fredericton, 454-6062.

Unlike many problems, we know at least some of the causes and cures for the ecological and economic ills of "acid rain." The actions suggested above all represent small steps toward realizing the cures. They also reflect a concern for the health of this planet which extends beyond the brief period of our lives. If we don't act soon, irreversible damage to the environment will continue and the price that we weren't willing to pay in the 1980's will look to our children like a missed bargain.