

Rachel's Environment & Health News

#20 - Toxic Pollutants Increasing In The Nation's Rivers; Study Says Coal And Fertilizer Are Causes

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There's good news and bad news about water-quality trends in the nation's rivers. The good news is that bacteria levels are decreasing because of new sewage treatment plants, and lead concentrations are generally decreasing because of reduced lead in gasoline. The bad news is that the levels of toxic arsenic and cadmium are increasing, probably from coal combustion and the smelting of metals; levels of salt are increasing, probably from the salting of roads; and levels of nitrate nitrogen are up, probably from increased use of fertilizer on crops and from fossil fuel (coal and oil) combustion.

These are the conclusions of a new study of water-quality trends in the nation's river system, published in SCIENCE magazine March 17, 1987 (pgs. 1607-1615).

The nation has spent over \$100 billion on new sewage treatment plants during the past 15 years and these have curbed bacteria in our rivers. Sewage treatment plants control "point sources" of pollution--specific pipes that introduce contaminants into waterways.

However, the study shows that water quality is widely affected by "non-point sources" of pollution--sources of pollution that are not a single pipe. These include runoff from farmers' fields, from city streets and rural highways, and chemicals spewed into the air from smoke stacks (chemicals that later rain down onto the earth and are washed into streams). The \$118 billion needed for additional sewage treatment plants will do nothing to affect these "non-point sources" of pollution.

The study looked at 24 measures of water quality taken at 380 sampling stations in two nationwide monitoring networks during the period 1974- 1981. The trends are important because they reveal that "end of the pipe" solutions are not doing the job they were designed to do: restoring the quality of the nation's waterways will involve structural changes in the way the nation does business. This is a conclusion the government, and traditional environmentalists, have in the past refused to face.

Fertilizer application rates increased 68% between 1970 and 1981. This trend must be viewed in the context of American farms falling into the hands of large farming corporations cooperating with, or directly owned by, American oil and chemical producers. One result of this increased fertilizer application is that nitrate loads increased significantly in East Coast estuaries, the Great Lakes and the Gulf Coast during the study period.

The other major contributor to nitrate loads is coal combustion. Here again, new ways of doing business will be needed if we are to control this menacing problem, but the political will for making the necessary changes seems to be lacking. The federal EPA seems eager to avoid controlling the mining, smelting and power companies responsible for the major coal-burning plants.

The nitrogen loading of East Coast estuaries, the Great Lakes and the Gulf Coast increased 20% to 50%, 1970 to 1981, and the trend is clear. Reversing the trend will not be easy, but it will be important to try. Nitrogen is the limiting factor on eutrophication in many estuaries, and the health of these especially-productive areas (e.g., Chesapeake Bay) is jeopardized by nitrate nitrogen. Acid rain is not the major reason for needing controls on coal; it is merely one more symptom of a serious and widespread malady in the American economy: our failure to see that an industrial enterprise based entirely on fossil fuel combustion no longer makes sense.

Coal combustion and the smelting of nonferrous metals has led to another problem: measurable increases of toxic arsenic and cadmium in the nation's rivers. This comes directly from coal burning and from non-ferrous smelters; (the arsenic and cadmium escape from the smoke stack, then rain down to earth). Arsenic is a famous poison, but cadmium is far more dangerous. Cadmium has been shown to cause heart disease in humans by making the arteries hard and inflexible. Cadmium accumulates in the body throughout a

person's life. It is a powerful and insidious chronic poison and its increasing presence in the nation's rivers is very unwelcome news. Arsenic and cadmium also enter the nation's waterways by leaching out of the fly ash stored at coal burning plants and at nonferrous smelters, so fly ash is not a benign waste and it should be tightly regulated. It is not.

Salting of roads is a widespread practice. Naturally the salt has to go somewhere and it goes into the nation's rivers and groundwater. Most people would agree that it makes little sense to throw salt into our fresh water supplies. Yet in America between 1950 and 1980, our annual use of salt on roads increased twelve-fold; from 1970 to 1981 the salt levels in the nation's rivers increased 30%.

Probably the most important and far reaching conclusion of this study is that the nation's water quality monitoring networks don't yield the data we need so we can understand what's really going on. For example, lead is decreasing in most of the nation's rivers, yet it is INCREASING along the Texas Gulf coast and in the lower Mississippi basin. The data are too crude to reveal why this is so. The study shows that--20 years into the "environmental crisis"--Americans are still served by a water quality monitoring system that gives only crude indications of gross trends. It is part of our government's grand failure to develop a database of environmental baseline information.

For further discussion of this study, see Science News April 4, 1987, pg. 214.

--Peter Montague

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