

# Acid Rain

Acid rain is formed when sulfur dioxide and nitrogen oxides reach the air and are transformed into sulfate or nitrate particles. When combined with water vapor, they are converted into sulfuric or nitric acids. Acid rain can adversely affect aquatic life, erode stone buildings and marble statues, and seriously threaten trees and crops.

Power plants that burn coal to generate electricity are a chief cause of acid rain. Coal burning releases sulfur dioxide into the air. Sulfur dioxide then combines with free oxygen and water vapor to form small quantities of sulfuric acid in our rain.

The Maryland Department of the Environment (MDE) has worked to reduce acid rain by restricting the amount of sulfur allowed in the coal burned by power plants and other industrial sources. In the Baltimore-Washington area, where pollution is concentrated, plants may burn only coal with one percent sulfur or less. In rural locations, a maximum sulfur content of two percent is allowed.

Nitrogen oxide emissions from cars also contribute to acid rain. These emissions are being reduced by new car emissions standards that have been established by the U.S. EPA. In Maryland, nitrogen oxide controls are also required for new municipal waste incinerators and power plants.

MDE operates acid rain monitoring stations in Rocky Gap State Park in Allegany County and at the Elms Environmental Center in St. Mary's County. Both stations were established in 1984 to determine the long-term effects of acid deposition in Maryland.

Studies are underway to measure the environmental effects of acid rain in Maryland. The studies are conducted jointly by the Maryland Departments of Natural Resources and Environment. The results of this research help us better understand the problems and costs of controlling acid rain.

The 1990 federal Clean Air Act Amendments require power plants across the nation to reduce sulfur dioxide and nitrogen oxide emissions. The amendments also impose tougher emissions standards for passenger cars and light duty trucks. These measures will reduce significantly the pollutants that contribute to acid rain formation.

Acid rain has become a pressing problem in this country and in Canada, where fishing is both a way of life and an integral part of the economy. Controlling acid rain is especially important in Maryland for the restoration and preservation of the Chesapeake Bay, since evidence suggests that some aquatic species are affected by acid rain.

Aquatic life at all levels of the food chain can be harmed by acid rain. Destruction begins at the lowest level of the food chain, when the tiny microorganisms that are food for minnows and other small organisms die. As food sources dwindle, more and larger fish die. Acid in the water may also interfere with oxygen circulation, harm fish gills, and cause heart problems in fish.

Even though acid rain is a complex global problem, there are things that each of us can do to help control it. Conserving energy helps by reducing electricity demands on our power plants. Carpooling also helps, by reducing emissions of nitrogen oxides. And widespread recycling will also help control acid rain. By minimizing the volume of waste we generate, we are contributing to reductions of nitrogen oxide emissions from waste incinerators. These are a few ways that, with enough individuals acting on behalf of the environment, each of us can make a difference.

Maryland Department of the Environment  
1800 Washington Blvd  
Baltimore, MD 21230  
410-537-3000 • 1-800-633-6101