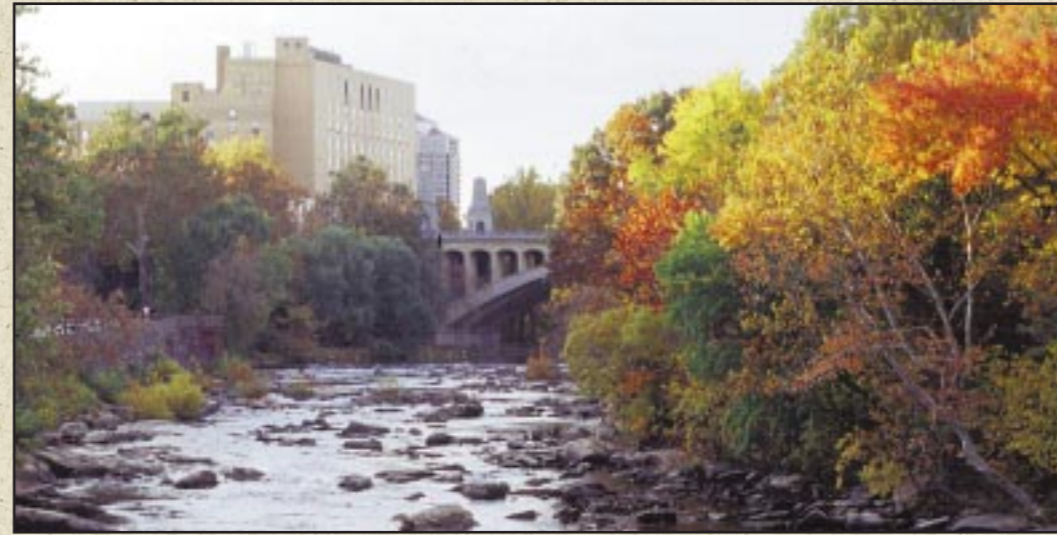


Air Quality

The air around us is constantly mixing and moving and cannot be confined to a locality or geographic area. Even so, air quality plays a major part in the Department's Whole Basin Planning process, and it is a very important factor in the Piedmont Basin's ecology. Although much of Delaware's air pollution is carried into the state on the prevailing winds, a significant amount of pollutants are added right here in the Piedmont Basin. These man-made particles and gases create environmental damage wherever the wind carries them.

CURRENT STATUS

Delaware has been measuring air quality for over 20 years and is required by federal statute to monitor levels of specific gases known as *criteria pollutants* on an hourly basis. Of all the air pollutants that are monitored and have clean air standards, only ozone occurs at levels that are above the federal standard and are classified as "unhealthy." Ozone is a colorless gas that is the main ingredient of smog. Ground-



Water quality is also affected by air pollution. As much as 30% of the nitrogen in some of Delaware's waters is believed to come from atmospheric deposition.

level ozone is a severe public health concern. It damages lung tissue, aggravates respiratory conditions, and makes people more susceptible to respiratory infections. Children are especially vulnerable to ozone's harmful effects. Ozone also causes damage to sensitive species of plants and agricultural crops.

Ozone is formed when a chemical reaction occurs between pollutants in the lower atmosphere on hot, sunny days. The air pollutants contributing most to ozone formation are *volatile organic compounds* and *nitrogen oxides*. There are many sources of both of these pollutants in the Piedmont Basin, including large and small industrial facilities, motor vehicles, chemical solvents, and natural sources. These chemical compounds can be carried far from their sources before reacting to form ozone. Ozone, or the compounds that form it, can be blown in to the Piedmont Basin from upwind areas such as Baltimore and Washington, DC. Ozone levels regularly reach unhealthy concentrations in the summer in the Piedmont Basin, as well as in many areas throughout the mid-Atlantic and northeastern United States.

AIR POLLUTION AND WATER QUALITY

Pollution deposition is another problem affecting the Piedmont Basin. This occurs when chemicals in the air are washed out by rain or settle out as dry particles. Acid rain and nitrogen compounds are the chief pollutants deposited in this manner in the Piedmont Basin. Acid rain can harm aquatic life in lakes and streams, damage vegetation, and erode masonry

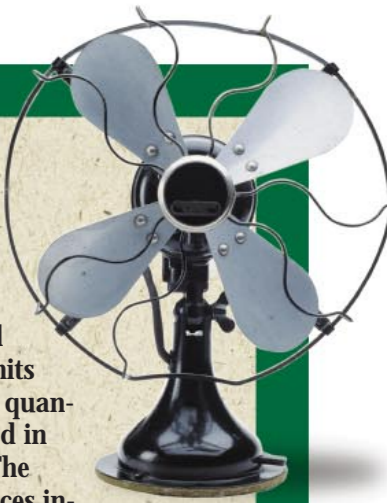
structures and statues. Nitrogen compounds can also affect rainwater acidity and add to the nitrate load (excess nutrients) of water bodies. Although the pH of rainwater in the Piedmont Basin is acidic, ranging between 4.2 and 4.3 (clean rain is 5.6), no acidic bodies of water currently are present. While few measurements have been made of nitrogen deposition in the Piedmont Basin, research in nearby states indicates that a significant amount of nitrogen is entering the ecosystem from atmospheric pollution.

Many other chemicals known or suspected to be capable of causing harm to people can be detected in air in very low concentrations. These chemicals are often referred to as *air toxics* and can come from many sources including industrial facilities,



Pollution which contributes to ozone comes from large industrial sources, car exhaust, and some small businesses.

transportation sources, and chemical processes. There are no acceptable official standards for outdoor air concentrations of these chemicals; instead they are controlled through permit limits placed on industry. The emissions are quantified on an annual basis and published in the Toxics Release Inventory (TRI). The Piedmont Basin contains over 20 sources included in the TRI. However, TRI data show a significant decrease, from 1989 to 1994, in the amount of toxic chemicals released annually.



Challenges for the Future

While ozone levels continue to be a problem in the Piedmont Basin, the number of days with unhealthy concentrations has been declining over the last ten years. This is a result of the many pollution control and prevention programs that have been implemented, including tougher emission controls on large industries, reformulated gasoline, and cleaner operating cars. These controls, as well as some additional measures, will continue to be needed as population increases in the Piedmont Basin.

- ◆ The National Acidic Deposition Program, as part of the Clean Air Act of 1990, sets goals for decreasing emissions of pollutants that contribute to acid rain. A specific goal is to reduce annual emissions of sulfur dioxide by 10 million tons between the years 1980 and 2010. While this program reported an improvement in rainwater acidity at a number of sites in 1995, Delaware's monitoring site nearest to the Piedmont Basin has yet to show any significant change.
- ◆ While the Toxics Release Inventory has shown reductions in releases of toxic chemicals since 1989, Delaware's goal is to further reduce emissions another 30% over 1995 levels by the year 2000.
- ◆ Monitoring for ozone, acid rain, and other pollutants will continue as the best means of tracking progress toward cleaner air. Delaware will also continue to gather information and cooperate with neighboring states regarding the effects of pollution deposition on land and water. We will also work closely with the EPA to develop the large-scale pollution prevention and control programs needed to meet all clean air quality standards.

1993 Ozone Inventory Emissions in New Castle County

