The reactions of sulfur oxides to form sulfuric acid are quite slow. Sulfur dioxide may remain airborne for 3-4 days. As a consequence, acid rain derived from sulfur oxides may travel for hundreds of miles or even a thousand miles. Nitrogen oxides may persist for only about one half day and therefore may travel only tens or hundreds of miles.

Introduction

Once airborne, the sulfur and nitrogen oxides eventually come down in one form or another. Where they come down depends on the height of the smokestack and the prevailing weather conditions. In general, prevailing winds in North America transport pollutants from west to east or northeast. The nine largest coal burning states are in the Midwest and the Ohio River valley. It is estimated that two thirds of the acid rain in the Northeast and Eastern Canada comes from these sources.

Blue arrow shows the upper winds that travel from the west to the east or northeast. Winds travel from the mid-west to the northeast. In addition, a copper-nickel smelter in Sudbury, Ontario, just north of Lake Huron is the most significant sulfur oxide source in Canada. The winds may also carry the sulfur oxide clouds to the Northeast in the U.S. where it may be converted to acid rain.

**Wind Circulation over North America**

Since the Clean Air Act Amendments of 1990, there have been significant decreases in the amount of sulfur oxides escaping from the electric power plants. As a result, there has been a measurable reduction in the amount of acid rain, which is actually translated as an increase in the pH levels (higher pH means less acid).

**pH of Acid Rain over a Period of 50 years**

These maps show how the areas of lower pH have spread in a 30 years 1955-1988. Darkest area is lowest pH. Since the Clean Air Act Amendments of 1990, there have been significant decreases in the amount of sulfur oxides escaping from the electric power plants. As a result, there has been a measurable reduction in the amount of acid rain, which is actually translated as an increase in the pH levels (higher pH means less acid).
Contributors

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