

EFFECTS OF ACID RAIN ON MATERIALS, VISIBILITY AND HUMAN HEALTH

Effects of Acid Rain on Materials

Acid rain and the dry deposition of acidic particles contribute to the corrosion of metals (such as bronze) and the deterioration of paint and stone (such as marble and limestone). These effects seriously reduce the value to society of buildings, bridges, cultural objects (such as statues, monuments, and tombstones), and cars.



Acid rain stone erosion to statue.

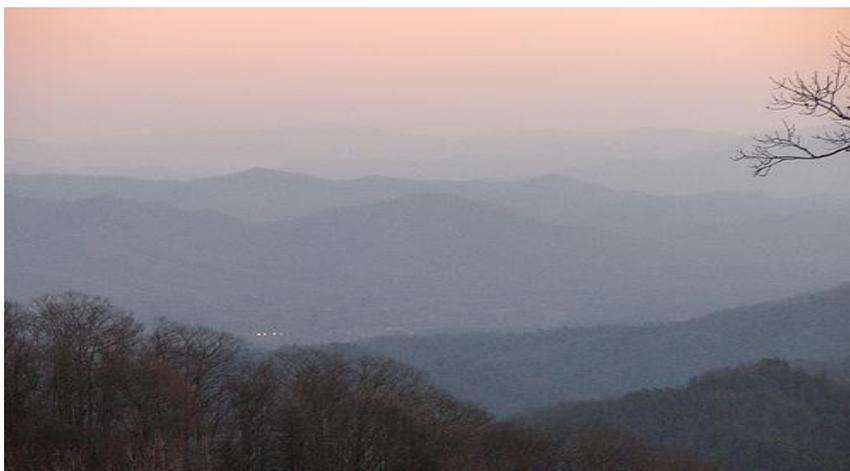
Effects of Acid Rain on Visibility

Sulfates and nitrates that form in the atmosphere from sulfur dioxide (SO₂) and nitrogen oxides (NO_x) emissions contribute to visibility impairment, meaning we can't see as far or as clearly through the air.

Eastern United States

Sulfate particles account for 50 to 70 percent of the visibility reduction in the eastern part of the United States, affecting our enjoyment of national parks, such as the Shenandoah and the Great Smoky Mountains.

Through the Acid Rain Program, SO₂ reductions will be completed to improve visual range at national parks located in the eastern United States. Based on a study of the value national park visitors place on visibility, these reductions are expected to be worth over a billion dollars annually by the year 2010.



Great Smoky Mountains.

Western United States

In the western part of the United States, nitrates and carbon also play roles, but sulfates have been implicated as an important source of visibility impairment in many of the Colorado River Plateau national parks, including the Grand Canyon, Canyonlands, and Bryce Canyon.



The Grand Canyon.

Effects of Acid Rain on Human Health

Acid rain looks, feels, and tastes just like clean rain. The harm to people from acid rain is not direct. Walking in acid rain, or even swimming in an acid lake, is no more dangerous than walking or swimming in clean water. However, the pollutants that cause acid rain also damage human health.

- **Effects of Sulfur Dioxide (SO₂):** These gases interact in the atmosphere to form fine sulfate and nitrate particles that can be transported long distances by winds and inhaled deep into people's lungs. Fine particles can also penetrate indoors. Many scientific studies have identified a relationship between elevated levels of fine particles and increased illness and premature death from heart and lung disorders, such as asthma and bronchitis.
- **Effects of Nitrogen Oxide (NO_x):** Decrease in nitrogen oxide emissions are also expected to have a beneficial impact on human health by reducing the nitrogen oxides available to react with volatile organic compounds and form ozone. Ozone impacts on human health include a number of morbidity and mortality risks associated with lung inflammation, including asthma and emphysema.