



Briefing Statement

Bureau: National Park Service
Issue: Air Quality Issues
Park Site: Great Smoky Mountains National Park
Date: April 26, 2010

Background: Monitoring and research conducted for nearly 30 years at Great Smoky Mountains National Park (GRSM) has shown that air pollution is significantly affecting park resources (streams, soils, vegetation and visibility), visitor enjoyment and public health. The burning of fossil fuels (e.g. coal, oil, and gasoline) produces emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon, and mercury (Hg) that convert into harmful secondary pollutants (e.g. sulfates, nitrates, fine particles, organics, ozone, and methylmercury). Winds coming into the southern Appalachians carry pollutants from not only the Tennessee valley, but as far away as the Ohio and Mississippi valleys, the industrial cities of the Southeast and Midwest.

The park experiences some of the highest measured amounts of air pollution of any national park in the U.S. The park is currently designated as part of the Knoxville non-attainment area by the Environmental Protection Agency (EPA) for the 8-hour, 85 ppb ozone public health standard, the annual fine particle (PM_{2.5}), and 24-hour final particle public health standards. In March 2008, EPA implemented a new 8-hour ozone health standard of 75 ppb, which was later remanded back to EPA in 2009, and a new standard was proposed in January 2010 of 60-70 ppb. EPA will finalize the new standard in August, 2010. Both the Tennessee and North Carolina-sides of the park will not meet the range of the proposed new ozone standard.

Ozone concentrations during the summer months routinely exceed standards to protect public health and vegetation. There have been 264 unhealthy ozone days since 1997 under the older 85 ppb standard and over 500 days under the new 75 ppb standard. Over 30 species of plant life show visible foliar damage from ozone pollution and can affect plant growth and species composition. Visibility on the worst days averages about 15 miles, much less than the estimate of natural visibility conditions (77 miles). Sulfate particles account for 84% of the haze on the worst days. High levels of acid deposition are acidifying high elevation streams and saturating soils with too much nitrogen deposition which harms wildlife and trees. Twelve streams on the Tennessee-side of the park have been listed on EPA's 303(d) list of impaired waters for failing water quality standards (low pH levels [<6.0] from acid deposition). High levels of mercury deposition are also posing a threat to the park's food web. High levels of mercury have been found in a variety of bird species.

Current Status: Although air quality in most urban areas throughout the country had been improving over the past two decades, air quality at GRSM showed signs of further deterioration due to a) emission increases of NO_x and SO₂ in eastern Tennessee, and 2) from hot summer weather conditions contributing to the formation of poor air quality. The most recent NPS 10-year air quality national assessment (1998-2007) shows that air quality trends at the park is improving (ozone concentrations, visibility, fine particles, sulfate deposition, and nitrate deposition) or remaining stable (ammonium deposition). Even though air quality has shown significant improvements over the past decade, air quality problems continue including non-attainment areas of the public health standards for ozone and particulate matter, visibility impairment from regional haze, and aquatic and terrestrial impacts from acid deposition and mercury.

Park managers had been optimistic that air quality would improve at GRSM in the near future from several recent air quality regulations and other related actions. But because of actions in 2008 by the D.C. Circuit Court of Appeals decisions vacating the EPA's Clean Air Mercury Rule (CAMR) and the Clean Air Interstate Rule (CAIR), the implications and ramifications are still uncertain as to the effects of these rulings on the park's future air quality, the state's Implementation Plans, and on a number of other EPA rules and programs, including the 8-hour ozone and fine particulate matter implementation rules and the regional haze rule. The EPA CAIR rule promulgated in 2005 for eastern states would have lowered electric utility emissions of SO₂, and NO_x by an additional 73% and 61%, respectively, by 2015. Pollution would have been capped at the reduced levels providing long-term protection against future air quality deterioration caused by utilities. The vacature of CAIR was a setback for the environment and park's ability to meet public health standards and restore the park's air quality-related values. In 2009, EPA reinstated CAIR and hopefully a more formal final rule or law will be approved to ensure these CAIR-like reductions.

Another EPA program took effect in 2004 that reduced NO_x in most eastern states by 30% (NO_x SIP Call). The Tennessee Valley Authority (TVA) installed NO_x emissions controls (selective catalytic reduction) on the 2 closest power plants to the park, which reduced emissions by 71%. This has led to less ozone pollution and nitrogen deposition in the park.

The TVA also announced in 2001 that they would be installing SO₂ controls (scrubbers) on the two closest power plants to the park by the end of 2010, which will reduce SO₂ emissions by over 90 percent and further improve the park's air quality by lessening haze, particle pollution, acid rain, and mercury. Additionally, due to recent court decisions (NC vs. TVA) TVA will install scrubbers on the John Sevier and Widow's Creek coal-fired power plants by 2014.

The State of North Carolina passed the Clean Smokestack Act in 2002, which will reduce electric utility emissions of SO₂ by 73% by 2013, and NO_x by 77% by 2009.

The EPA issued the Clean Air Diesel Rule in 2005 that will cut NO_x emission from non-road construction, agricultural and industrial diesel-powered equipment by more than 90% by 2015. The rule will also remove 99% of the sulfur in diesel fuel by 2010.

Interested Parties/Interests: Power generation and industrial interests, state regulatory bodies, tourism industry, public health agencies, environmental groups.

Next Steps/Strategy: Continue to collaborate with state and local regulatory agencies, EPA and regional planning organizations (VISTAS) to develop and implement visibility, fine particle, and ozone State Implementation Plans (SIPs) and further look for ways to reduce emissions to protect the park's air quality related values. The Park is working with the State of Tennessee and EPA to protect acid-sensitive park streams from acid deposition. The Park is working with TVA jointly conducting monitoring and research at the park. These efforts will help to meet air quality health standards, reasonable progress for visibility improvements by 2018, and deposition impacts from nitrogen, sulfur and mercury are lessened to better protect public health and park resources.

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