

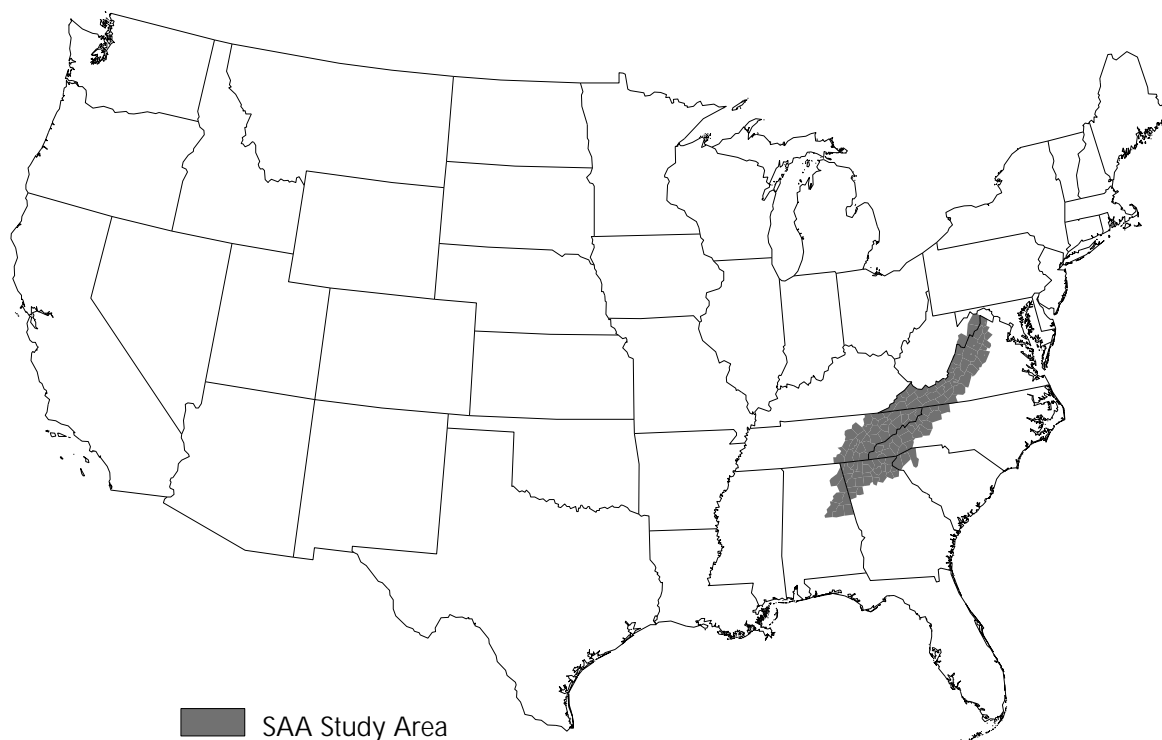
Introduction

The words “air pollution” call up images of smog hanging over a city, smoke coming from a stack at a factory, or a dark cloud from a vehicle’s tailpipe. But, modern society is dependent on the combustion of fossil fuels for transportation, electricity, industrial processes, and heating of homes and businesses. The combustion of fossil fuels generates energy, and along with it toxic gases and particulates. These pollutants are transformed in the atmosphere and transported throughout the region, affecting people and resources in the Southern Appalachian Assessment (SAA) area (fig. 1.1).

Rarely can air pollution impacts to resources in the Southern Appalachian area be traced back to a single source. The environ-

mental damage in the Copper Hill area in eastern Tennessee is probably an exception and can be attributed to specific sources. The Copper Hill area experienced a century of severe environmental abuse from crude copper-smelting operations and practices. Uncontrolled emissions of sulfur dioxide were so large that they were toxic to vegetation. Approximately 32,000 acres of the basin were severely affected by copper smelting. Fuelwood procurement for the smelter and grazing by livestock also had an impact on the basin. The impact to the Copper Hill region was so extensive that damage could still be seen 50 years later when the Tennessee Valley Authority began reclamation work in the area (Muncy 1986).

Figure 1.1 Location of the Southern Appalachian Assessment study area.



The air pollution impacts that are likely to be seen today in the Southern Appalachian area cannot be traced back to one, or even a few sources of pollution. Instead, pollutants are generated both within and outside of the SAA area at distances hundreds of miles away. Air pollution is produced in several ways: stationary or point sources such as power-generating plants and industrial facilities; area sources such as dust from roads, open burning, and smoke from fires; or mobile sources such as automobiles, trucks, and aircraft. Furthermore, many pollutants emitted directly from these sources are transformed in the atmosphere into secondary pollutants, such as ozone and sulfate and nitrate deposition. Secondary pollutants discussed in this report are those that are most likely affecting the forest environment.

Chapters 2 through 6 of this report answer specific questions developed at the beginning of the assessment process by public discussion. The Atmospheric Team added other questions which were important for natural resource plan-

ning. A question begins each chapter, and an introduction explains why the question is important. Next, the chapter presents data sources and methods used to answer the question. Finally, findings are presented, when available, on the current status, trends, impacts, and the predicted future to the year 2010 for the pollutants that each question addresses. Chapter 7 identifies data gaps where additional information would have improved interpretations.

The information presented is for a broad-scale assessment which focuses on air quality issues and the potential impact to forest ecosystems. Results may be viewed like an impressionistic painting where a viewer needs to stand back some distance in order to see the larger pattern more clearly. Therefore, the information and data presented should be used cautiously and may not apply for local planning; that is, a statement that holds true for the whole Southern Appalachians may not hold true for a specific site in the assessment area.