CHAPTER 1
INTRODUCTION

The Southeastern Aerosol and Visibility Study (SEAVS) was conducted from July 15, 1995 through August 25, 1995 in Great Smoky Mountains National Park. The study was a collaborative effort between several universities, consulting firms, the Electric Power Research Institute (EPRI), and the National Park Service (NPS). This report, however, focuses primarily on summarizing the work conducted by the NPS sponsored groups. The report includes: (1) the optical and meteorological measurements made by Air Resource Specialists, Inc. (ARS), (2) the aerosol chemical composition and size distribution measurements made by the University of California at Davis (UCD), and (3) the measurements of aerosol hygroscopicity made by Colorado State University (CSU).

The overall objectives of this group's research efforts were to: (1) better understand the physical, chemical, and overall optical characteristics of the ambient aerosol under the humid conditions observed in the southeastern United States during the summer months and how these characteristics related to visibility issues. Specific technical objectives included:

- Document the intensity of haze and estimate the contributions of scattering and absorption components to the total light extinction.

- Compare the chemical composition data from the IMPROVE sampler with data from other sampling systems.

- Document the chemical composition of the aerosol and identify each components contribution to mass and light extinction.

- Document the aerosol size distribution, how the distribution changes in time, and how these changes impact scattering efficiencies.

- Measure the hygroscopic properties of the ambient aerosol and compare measured water uptake to theoretical model predictions.

Chapter 1 of this report gives an overview of the study, explains the study's objectives, and describes the sampling site. Chapter 2 overviews the measurements that were made by the NPS group of researchers, illustrates the instrument and sampler configurations, and explains the field measurement protocol of the samplers and instruments. Chapter 3 summarizes calibrations of the various instruments, the uncertainty of the measurements, and the quality assurance procedure enlisted for this study. Chapter 4 gives the results of the measurements of aerosol hygroscopicity. Chapter 5, in general, is composed of data analyses and gives the results of various model calculations, which were compared to the measurements made during the study.