METEOROLOGICAL AND PRECIPITATION CHEMISTRY MONITORING

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Cooperators

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National Atmospheric Deposition Program
US Geological Survey
NOAA National Weather Service
Electric Power Research Institute (EPRI)

Objectives:

Continuous monitoring of meteorological variables and precipitation chemistry at several locations at the VMC Mansfield site.

Methods

Several monitoring stations were operated in 1991

1. Basic meteorology (continuous temperature, relative humidity, wind speed and direction, and precipitation amount) is monitored at the main air pollution monitoring station at PMRC (400 m). This station has remote (modem) access and has been in continuous operation since 1988. Data are updated continuously and are locally stored electronically and in hard copy, and are available from the project manager Tim Scherbatskoy. Cooperators are Sumner Williams and Mel Tyree at PMRC. Funding to support this station comes from the VMC. During its first two years it was operated by EPRI.

2. VAPMP (Vermont Acid Precipitation Monitoring Program) collects bulk precipitation samples on an event basis for analysis of amount and pH. Samples are collected at the main air pollution monitoring station at PMRC (400 m) and near the WCAX-TV transmitter station near the nose of Mt. Mansfield (1205 m), and at 10 other sites around Vermont. These stations have been in continuous operation since 1983 (PMRC) and 1980 (Mt. Mansfield summit). Data are collected and stored by VT DEC Water Quality Division where the program supervisor is Jim Kellogg, from whom data are available. Cooperators are Sumner Williams at PMRC and the staff at the WCAX-TV transmitter facility. Funding to support these two station comes from the VT Department of Environmental Conservation.

3. The National Weather Service under NOAA supervises a cooperative weather station at the WCAX-TV transmitter station near the nose of Mt. Mansfield (1205 m), as well as at 42 other stations around Vermont. This station has monitored temperature (daily minimum, maximum and temperature at time of observation) and precipitation amount (daily rainfall, snowfall and snow depth

on the ground) since 1954. Data are collected and stored by the NOAA National Climatic Data Center. The VMC does not directly support this station, but has access to its data, which are available for the period 1954-1991 from Tim Scherbatskoy. Funding for this station comes from the National Weather Service and the cooperation of WCAX-TV.

4. The NADP/NTN (National Atmospheric Deposition Program/National Trends Network) maintains a site at the main air pollution monitoring station at PMRC (400 m) for the weekly collection of precipitation for chemical analysis. Precipitation amount, pH and conductivity are measured locally, and the sample is then shipped to the NADP Central Analytical Laboratory in Illinois for analysis of pH, conductivity, Ca, K, Mg, Na, NH4, NO3, Cl, SO4 and PO4. This station has been operational since 1984, and is part of a national network of over 200 stations including one other in Vermont at Bennington. The site supervisor is Tim Scherbatskoy, and the site operator is Sumner Williams at PMRC. Funding to support this station comes from the US Geological Survey.

Significant Findings

At this time, no major results from these projects are available, except for the raw data itself. Database consolidation for the basic meteorology station at PMRC (1 above) is still in progress; completion and subsequent analysis is expected by June 1. The database for VAPMP (2 above) is up-to-date, but no data interpretation is planned for individual stations or the program in the near future; the last program report was in 1986. Analysis of data from the Mt. Mansfield weather station (3 above) is underway; results are expected in May, 1992. Data analysis of the NADP station (4 above) is available for each preceeding quarter from the site supervisor, and is available for the entire network annually from NADP; the last annual data summary is dated 1990.

Future Plans

All of these stations will continue to operate in 1992-93. Updates for the Mt Mansfield weather station (as well as all other National Weather Service Vermont stations) will be obtained annually.

In addition, two new monitoring projects will come on-line in 1992. Ambient atmospheric mercury concentrations will be monitored at the PMRC basic meteorology site (1 above) beginning in June. This project will measure gaseous, aerosol, and precipitation phases of total mercury several times a week throughout the year. This work will be supported by NOAA and the Lake Champlain Research Consortium. A second related project coming-on line in June is the monitoring of meteorology and ozone at multiple locations in a hardwood canopy at PMRC. Details about this project are provided in this volume under the research abstract "Measurement of environmental and pollutant gradients in the forest canopy."