

Nescaum Regional Particle Monitoring Network

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Air Quality monitoring at the Underhill, VT VMC site includes a station in a regional particle monitoring network, initiated in 9/88 by the Northeast States for Coordinated Air Use Management (NESCAUM). The NESCAUM monitoring objective is to promote a better understanding of aerosol concentration and composition in the northeastern US. Seven regionally representative sites are operated by the State Air Pollution Control Programs in NY, NJ, CT, MA, ME, NH, and VT, in cooperation with the Crocker Nuclear Laboratory at the University of California at Davis (UCD).

Fine fraction (< 2.5 micron) particles are collected for 24 hours, 3 times a week, and analyzed at UCD for mass, light absorption and the elements: Al, As, Br, Ca, Cr, Cl, Cu, Fe, H, K, Mg, Mn, Na, Ni, Pb, Se, Si, S, Ti, V, and Zn. Particles in this size range include a majority of aerosol-phase sulfates, nitrates, toxic metals and organics which potentially affect human health and visibility. They are particularly susceptible to long-range atmospheric transport, and form efficient condensation nuclei, ultimately transferred by rain, snow, fog and clouds to terrestrial and aquatic ecosystems at considerable distance from pollutant sources.

NESCAUM sampling and analytical methods are compatible with several larger US networks, including the National Park Service Congressional network (NPSC), and the Interagency Monitoring of Protected Visual Environments (IMPROVE). The NESCAUM sites are scheduled for inclusion in the planned EPA Clean Air Status and Trends Network (CASTNET). The NESCAUM aerosol data through 11/31/91 are readily available in ASCII or Voyager formats, and will be included in the VMC Data Integration Pilot Project. A list of currently available reports and publications is attached.

The high-resolution sampling and analytical methods provide a detailed picture of aerosol concentration and composition at the VMC site, as in Figure 1. Comparable methods and data format allow the data to be viewed in a larger regional or national context, as in figure 2. Inclusion in CASTNET would assure continuation of a relatively long-term record.

Fig. 1 Monthly Fine Particle Composition at Underhill, VT VMC Site

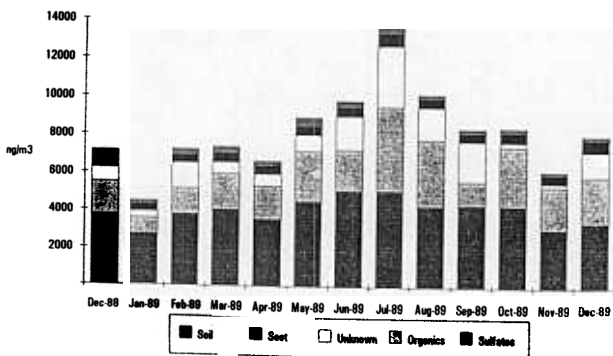
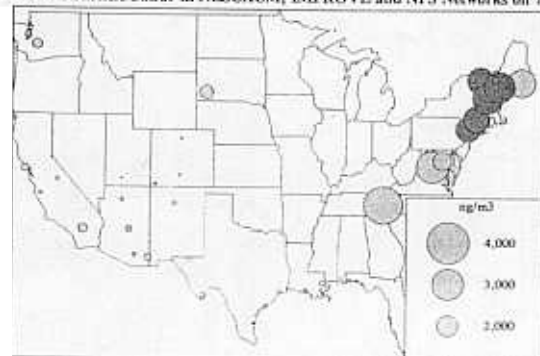


Fig. 2. Fine Particle Sulfur in NESCAUM, IMPROVE and NPS Networks on 7/19/89



**NESCAUM Regional Particle Monitoring Network (NEPART)
Reports and Publications Utilizing NEPART Data**

- R.G. Flocchini, T.A. Cahill, R.A. Eldred and P.J. Feeney (1989), "Particulate Sampling in the Northeast: A Description of the Northeast States for Coordinated Air Use Management (NESCAUM) Network", Transactions AWMA/EPA Spec. Conference on Visibility and Fine Particles, C.V. Mathai ed., pp. 197-206.
- R.L. Poirot, R.G. Flocchini and R.B. Husar (1990), "Winter Fine Particle Composition in the Northeast: Preliminary Results from the NESCAUM Monitoring Network", 90-84.5, 83rd Annual AWMA Meetings, Pittsburgh, PA.
- R.L. Poirot, P.J. Galvin, N. Gordon, S. Quan, A. Van Arsdale, R.G. Flocchini (1991), "Annual and Seasonal Fine Particle Composition in the Northeast: Second Year Results from the NESCAUM Monitoring Network" 91-49.1, 84th Annual AWMA Meetings, Vancouver, B.C.
- W.C. Malm, Y. Golestani, T.A. Cahill, R.A. Eldred, R.L. Poirot and K.A. Gebhart (1991), "Estimation of Aerosol Acidity in the Eastern United States", 91-89.3, 84th Annual AWMA Meetings, Vancouver, B.C.
- B. Schichtel and R. Husar (1991), "Composition of Aerosols over the Continental U.S." Report PL-TR-91-2180, Phillips Laboratory, Air Force Systems Command, Hanscom AFB, MA.
- B. Schichtel and R. Husar (1991), "Apportionment of Light Extinction by Aerosol Types over the U.S. Report to Phillips Laboratory, Air Force Systems Command, Hanscom ARB, MA.
- B.A. Schichtel and R.B. Husar (1992), "Aerosol Types over the Continental U.S. Spatial and Seasonal Patterns", 92-60.07, 85th Annual AWMA Meetings, Kansas City, MO.
- B.A. Schichtel, R.B. Husar, W. Wilson, R.L. Poirot and W.C. Malm (1992), "Reconciliation of Visibility and Aerosol Composition Data over the U.S.", 92-59.08, 85th Annual AWMA Meetings, Kansas City, MO.
- R.B. Husar and R.L. Poirot (1992), "Exploration of the AIRS Database: Weekly Cycle of Ozone and PM-10 Aerosols", 92-77.06, 85th Annual AWMA Meetings, Kansas City, MO.
- S.T. Rao and P.S. Porter (1992), "Estimation of Central Tendency from Multiply Censored Air Monitoring Data" to be presented at AWMA International Symposium on the Measurement of Toxic and Related Air Pollutants, R.T.P., N.C.
- P.S. Porter, S.T. Rao and R.L. Poirot (1992), "Statistical Analysis of Environmental Data Affected by Limits of Detection: A Question of Measurement Error" to be presented at the International Symposium on Environmetrics, Espoo, Finland.
- R. Poirot, P. Wishinski, R. Flocchini, R. Husar, B. Schichtel, P. Galvin, G. Keeler, R. Artz, A. Van Arsdale (1992), "Transboundary Implications of Visibility--Impairing Aerosols in the Northeastern United States (Part I): Space/Time Patterns from the NESCAUM Aerosol Network", to be presented at 1992 Joint Spring Session AGU/CGU/MSA, Montreal, Quebec.
- P. Wishinski, G. Keeler, R. Artz, P. Galvin, R. Flocchini, R. Husar, B. Schichtel, A. Van Arsdale, R. Poirot (1992), "Transboundary Implications of Visibility--Impairing Aerosols in the Northeastern United States (Part II): Air Trajectory Assessment of the NESCAUM Aerosol Data", to be presented at 1992 Joint Spring Session AGU/CGU/MSA, Montreal, Quebec.