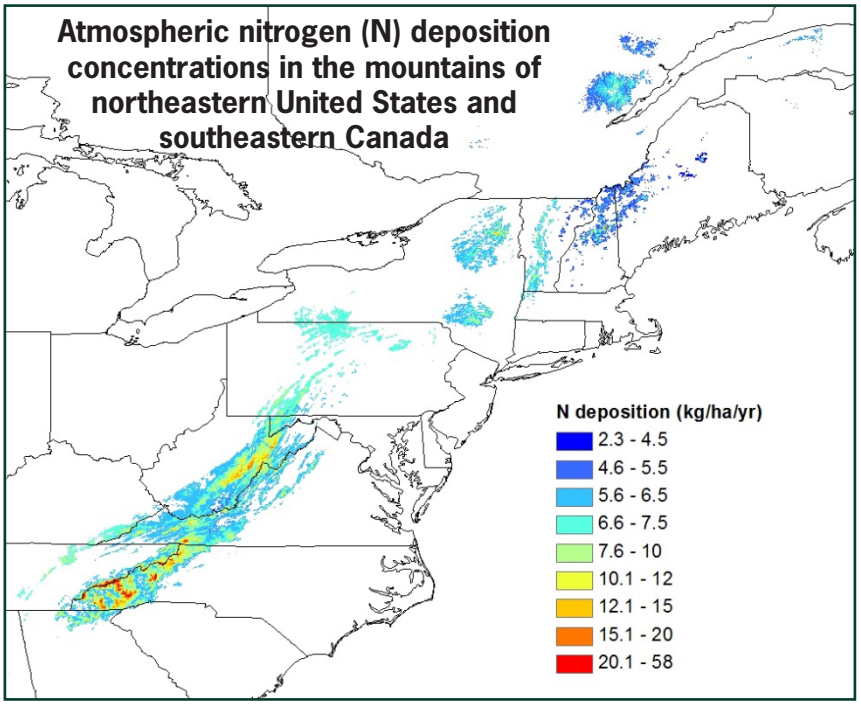
Project Impacts

NSRC-FUNDED RESEARCH FINAL REPORT

A Regional Model of Atmospheric Deposition for the Northeastern U.S.



PROJECT AWARD YEAR AND TITLE:

2001

A Regional Model of Atmospheric Deposition for the Northeastern US

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Atmospheric deposition is an important source of pollutants and nutrients to ecosystems in the northeastern United States. Estimates of total atmospheric deposition (wet + dry + cloud) are critical, not only to air pollution effects researchers, but also to decision-makers faced with the challenge of assessing policy initiatives. Nonetheless, estimates of total deposition for the Northern Forest region are still inadequate, particularly across complex mountainous landscapes. These regions are often most sensitive to atmospheric inputs and are locations of focused ecosystem research.

NSRC researchers collected and integrated data from the National Atmospheric Deposition Program, Clean Air Status and Trends Network, Canadian Air and Precipitation Monitoring Network, and other precipitation networks, in combination with Geographic Information System (GIS) data layers for land use/land cover and Oregon State University PRISM data for the northeastern United States. In addition, they analyzed throughfall (rain that reaches the forest floor) data from mountainous areas to build a montane deposition sub-model.

Researchers discovered a region of high deposition downwind of the Great Lakes. These “hotspots” are different and/or absent from most national deposition maps (either U.S. or Canada) primarily because hard data lines are created along national boundary lines. They also found that the range of total deposition, especially for mountainous regions, exceeds most past estimates that do not take into account vegetation and elevation effects on total deposition. The range of deposition from “cold” to “hot” spots for both nitrogen and sulfur is approximately 30-fold. Variations of these methods have since been used by other scientists to improve estimates of deposition for regional research.

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