

NEWS



SENATOR GEORGE J. MITCHELL CENTER FOR ENVIRONMENTAL AND WATERSHED RESEARCH

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*"We have an obligation to leave for future generations the very basics of human life on Earth;
clean air, pure water, unpoisoned land."*

Senator George J. Mitchell

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CLEAN AIR ACT REDUCES ACID RAIN; UMAINE RESEARCH INDICATES RECOVERY IN NEW ENGLAND REMAINS ELUSIVE

ORONO, Maine -- The federal Clean Air Act of 1990 appears to be successful in reducing two major types of air pollutants that contribute to acid rain, and signs of recovery are beginning to occur in lakes and streams in the Midwest and East, according to a report from the U.S. Environmental Protection Agency.

Steve Kahl, director of the Senator George J. Mitchell Center for Environmental and Watershed Research at the University of Maine, led the EPA research effort in New England and helped to lead the team that wrote the report. Katherine Webster, UMaine assistant professor of biological sciences, was a co-author of the report.

Researchers based their analysis on water quality data from five regions in the upper Midwest and East. Today, there are fewer acidic lakes and streams in the Adirondacks, the upper Midwest and the northern Appalachian plateau than there were in 1990. Nevertheless, those waters continue to be vulnerable to the effects of acid deposition. Their ability to buffer acidic precipitation has not significantly changed in the last decade, according to the report.

Data from about 100 lakes in Maine and another 286 in New England, indicates that there has been little net change in the acid status of waters in that region.

"The report emphasizes that there are significant uncertainties in our understanding of processes related to recovery of acidic lakes, and that research needs to continue for us to understand the effectiveness of the Clean Air Act and any future amendments," says Kahl. "We've seen reductions in sulfate that are linked to Clean Air Act regulations. Sulfuric acid does not control the acidity of surface waters as it used to," he adds.

Further changes are likely to occur as Clean Air Act regulations on nitrogen in air pollution are implemented. Other conclusions reached in the report include:

Acidity in eastern U.S. precipitation is at least double what it was in pre-industrial times, with rainfall in Pennsylvania and New York more acidic than that in New England and the Midwest. Although sulfuric acid levels have dropped in surface waters, nitric acid levels have not decreased.

Levels of dissolved aluminum in lakes and streams have dropped slightly in some regions and remain unchanged in others. Dissolved aluminum concentrations are related to acidity. The metal can impair reproduction in fish and amphibians, although its actual biological consequences are unclear.

Levels of calcium, magnesium and other acid buffering elements have dropped in lakes and streams for reasons that are unclear, and this change has offset some of the decrease in acidity that would have otherwise occurred. Dissolved organic compounds in water increased in every region and contributed natural acidity to surface waters.

Since climate change, forest growth and ecological processes can affect surface water chemistry, research is needed to fully understand the factors contributing to acidity in lakes and streams and the relationships with forest productivity and nutrients.

UMaine has worked closely with the EPA to monitor eastern lakes and streams and the environmental consequences of acidic deposition. Since 1982, EPA has contracted with UMaine to collect and analyze water samples for the national acid rain monitoring program. With additional support from EPA and other agencies, UMaine also continues to conduct acid rain research on land owned by the Champion Paper Co. in eastern Hancock County. As a result, the university maintains some of the longest running data sets on acid rain in the U.S.

The full EPA report is posted on UMaine's Senator George Mitchell Center's web page <http://www.umaine.edu/WaterResearch/>, under "Publications." In addition to Kahl and Webster, authors of the report include John L. Stoddard of the U.S. EPA, Frank A. Deviney and James Webb of the University of Virginia, David R. DeWalle of Penn State University, Charles T. Driscoll of Syracuse University, Alan T. Herlihy of Oregon State University, James H. Kellogg of the Vermont Department of Environmental Conservation, and Peter S. Murdoch of the U.S. Geological Survey. The 74-page report is titled Response of surface water chemistry to the Clean Air Act Amendments of 1990 and has the document number EPA/620/R-02/004.

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