

## **A Collaborative Assessment of the Effects of Watershed Calcium Depletion and Suburbanization on River Water Quality in the Delaware River Basin**

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### **Biographical Sketch of Presenting Author**

Pete Murdoch is a Research Hydrologist with the Watershed Research Group of the US Geological Survey in Troy, New York. Since 1982 he has lead research projects on watershed processes, and the effects of acid rain and climate change on water quality in streams of the Catskill and Adirondack Mountains of New York. In the mid-1990s he served as the DOI representative to the White House Committee on Environmental and Natural Resources (CENR), where he and others were charged with designing a strategy for integrating the Nation's environmental monitoring and research programs. Since 1998 Pete has been the technical lead on a pilot of that strategy in the Delaware River Basin.

### **Abstract**

The U.S. Geological Survey and the U.S. Forest Service are testing collaborative monitoring strategies in the northern Delaware River Basin through a set of issue-focused parallel studies. The Collaborative Environmental Monitoring and Research Initiative (CEMRI) enhances and links existing monitoring and research programs to address multi-scale environmental issues that could not be assessed by individual programs. Using plot- and watershed-scale sampling approaches, the collaborative study revealed a correlation between soil calcium availability and forest condition in the Catskill Mountains, and a decline in stream water calcium concentrations over the past 50 years.

At the regional scale, the study provided an integrated stream and soil chemistry survey in the upper Delaware basin that indicates a band of low-calcium streams and soils extending from the western Pocono Mountains in Pennsylvania to the eastern Catskills in New York. Land cover analysis by the USFS using high-resolution aerial photography, when linked to stream monitoring data from the USGS, indicates an inverse correlation between stream biological condition (EPT richness) and the suburbanization of watersheds in the Pocono Mountains.

The combination of intensive and extensive data collection, and integration of the forest-, soil-, and water-sampling programs of the USGS and USFS is providing a regional picture of the extent of soil calcium depletion and forest fragmentation, and the effects of these landscape disturbances on water quality in the upper Delaware River Basin.