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## News Releases



### Soil Science Society of America

677 South Segoe Road • Madison WI 53711-1086 • 608-273-8080 • Fax 608-273-2021  
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#### NEWS RELEASE

Contact: Sara Uttech, Soil Science Society of America, 608-268-4948, [suttech@soils.org](mailto:suttech@soils.org)

### Organic Soils Continue to Acidify Despite Reduction in Acidic Deposition

*Recent Research published in the January–February issue of Soil Science Society of America Journal shows that soil acidification poses a continuing threat to the health of forests in the northeastern United States.*

Madison, WI, January 12, 2009 – Following the Clean Air Act Amendments of 1970 and 1990 acidic deposition in North America has declined significantly since its peak in 1973. Consequently, research has shifted from studying the effects of acidic deposition to the recovery of these aquatic and terrestrial ecosystems. Regional-scale studies have focused primarily on aquatic systems and while many of these ecosystems are showing signs of chemical recovery (increases in acid neutralizing capacity and pH, decreases in sulfate and aluminum concentrations), recovery is slower than expected based on the magnitude of the decline in acid deposition. Researchers have long suspected that acidification of soils in these watersheds has slowed the recovery of aquatic ecosystems. Unfortunately, very few studies have examined change in soil chemistry. As a result our understanding of how soils have responded to decreases in acidic deposition at the regional scale is limited.

Researchers at Syracuse University sampled soils in 139 watersheds in the northeastern United States in 2001 that had previously been studied as part of the Direct/Delayed Response Project in 1984. The study showed that over the 17-yr interval, median base saturation in the Oa-horizon decreased from 56% in 1984 to 33% in 2001, while effective cation-exchange capacity, normalized to the soil carbon concentration, showed no significant change. The change in base saturation was the result of almost equivalent changes in carbon-normalized exchangeable calcium ( $Ca_N$ ) and exchangeable aluminum ( $Al_N$ ). The median  $Ca_N$  declined by more than 50%, from 23.5 to 10.6  $cmol_c/kgC$ , while median  $Al_N$  more than doubled, from 8.8 to 21.3  $cmol_c/kgC$ . This research, to be published in the January-February issue of the *Soil Science Society of America Journal*, was made possible by the financial support of the William M. Keck Foundation.

A somewhat surprising result was that the Central New England/Maine subregion, the subregion that historically has received the lowest inputs of acid deposition of any of the subregions, showed the greatest declines in exchangeable base cations and base saturation. This area also exhibited the greatest increases in carbon-normalized exchangeable acidity ( $acidity_N$ ) and  $Al_N$  and was the only subregion to experience a statistically significant decrease in pH. Lead author Richard Warby explained, "It is possible that the acidification of soils in this subregion was delayed relative to the other subregions because of the strong regional gradient in acidic inputs from west to east."

The researchers believe that the observed trend in soil acidification is likely to continue until acidic inputs decline to the point where soil base cation pools are sufficient to neutralize them. Warby concluded, "Until then we are likely to see the continued sluggish chemical recovery of surface waters and a continuing threat to the health of forests, with additional declines in base status likely to increase the number of sites exhibiting lower forest productivity and or vulnerability to winter injury."

The full article is available for no charge for 30 days following the date of this summary. View the abstract at <http://soil.scijournals.org/cgi/content/abstract/73/1/274>.

*Soil Science Society of America Journal*, <http://soil.scijournals.org>, is a peer-reviewed international journal published six times a year by the Soil Science Society of America. Its contents focus on research relating to physics; chemistry; biology and biochemistry; fertility and plant nutrition; genesis, morphology, and classification; water management and conservation; forest, range, and wildland soils; nutrient management and soil and plant analysis; mineralogy; and wetland soils.

The *Soil Science Society of America (SSSA)* is a progressive, international scientific society that fosters the transfer of knowledge and practices to sustain global soils. Based in Madison, WI, and founded in 1936, SSSA is the professional home for 6,000+ members dedicated to advancing the field of soil science. It provides information about soils in relation to crop production, environmental quality, ecosystem sustainability, bioremediation, waste management, recycling, and wise land use.

SSSA supports its members by providing quality research-based publications, educational programs, certifications, and science policy initiatives via a Washington, DC, office. For more information, visit [www.soils.org](http://www.soils.org).

SSSA is the founding sponsor of an approximately 5,000-square foot exhibition, *Dig It! The Secrets of Soil*, which opened July 19, 2008 at the Smithsonian's National Museum of Natural History in Washington, DC.