BOOK REVIEW

Acid Rain in the Adirondacks
An Environmental History
Jerry Jenkins, Karen Roy, Charles Driscoll, and Christopher Buerkett
Cornell University Press, 2007

Reviewed by JAMES C. WHITE

The Adirondack Park, the bull's-eye of North America's acid rain problem, is situated downwind in the densest path of acid rain pollution. For the general public, the acid rain problem has been eclipsed in recent years by the looming global threat of climate change. Yet it shares the same set of precursors—the combustion of fossil fuels. And the adverse impacts of acid rain in the Adirondacks continue, even with implementation of the 1990 Clean Air Act Amendments.

Herein lies the extraordinary value of *Acid Rain in the Adirondacks* with its two stories told in a dual narrative—one technically simple, the other illustrated with some 400 graphs and diagrams, notes and citations. The first story is the historical record of how, for more than a century, the deposition of acids and mercury from combustion of fossil fuels has changed the Adirondacks; the second story is how researchers, beginning in the 1970s, identified acid rain, measured and characterized it, and traced its ecological effects.

Modern acid rain research began in 1963 with sustained monitoring and analysis at the Hubbard Brook Research station in New Hampshire. In 1972 Likens, Bormann, and Johnson published the seminal article "Acid Rain" based on records from Hubbard Brook. In 1974, Cogbill and Likens showed that acid precipitation was occurring over much of the eastern United States, and in 1975 the first international conference on acid rain was held in Dayton, Ohio, drawing upon research in Canada, England, Germany, Scandinavia, and the United States. By 1978 a consortium of government and private research organizations had opened the first precipitation monitoring stations, including one at the Huntington Forest in Newcomb, New York, as part of the research program of the State University of New York College of Environmental Science and Forestry. In 1980 the U.S. Acid Precipitation Assessment Program, founded under legislation authored by New York Senator D. P. Moynihan, became the largest environmental research program ever conducted, providing over $500 million of funding for acid rain research over the next 10 years.

The volume reviewed here was written from the Adirondack viewpoint and context, where the studies, supported by both federal and state governments and utilities, account for much of our present day understanding and knowledge of acid rain in North America. The authors have detailed the history of research in the Adirondacks since Schofield reported in the mid-1970s that many high altitude Adirondack lakes were acidic and most of these were fishless. In 1984, New York State held its first conference on acid rain, followed by legislation that established the first state-based acid rain control program. The same year the Adirondack Lakes Survey Corporation was created, jointly sponsored by the state's Department of Environmental Conservation and the Empire State Electric Energy Research Corporation.

To help understand the complex chemical and physical reactions taking place in the waters and soils, this volume includes a complete set of definitions and acronyms, along with many diagrams and illustrations. The explanations of reactions and effects are remarkably clear and understandable.

The Adirondacks are unique in that they have many differing areas of soils, lakes, streams, mountains, and woodlands and the effects of acid rain differ in character and severity in the different subregions. Chapters cover the big synoptic studies of the 1980s; the cycling of sulfur and nitrogen; cycling and loss of calcium; wetlands, carbon, and mercury; fish, acids, and aquatic ecology; monitoring and trends. The concluding chapter gives responses to 14 current questions, including future needs and priorities based on a New York State Energy Research and Development Authority review in 2002. An appendix listing major Adirondack research studies and data on the Internet, and an extensive bibliography, make this book the most important current reference on the topic.

Much of the text reads like an unraveling mystery and demonstrates the value of long-term, continuous monitoring and trends analysis to determine effects of control programs. This book belongs on the shelf of all researchers studying the processes and impacts of airborne pollutants (including greenhouse gas emissions), as well as in the reference collection of everyone who cares about the Adirondacks.

The authors' sobering conclusion (noted in the Introduction!) gives an unmistakable message. "Acid rain . . . is a significant ecological threat . . . significantly, but only partially abated. . . . More abatement is needed, and even then recovery will be slow. Acid rain . . . is cumulative and persistent. Its effects on the Adirondacks began more than a century ago and even our most optimistic calculations suggest that they will continue through our lifetimes and beyond."

James White is an emeritus professor of Cornell University and the editor of several books on acid rain and climate change.He can be reached at jamescwh@peoplepc.com.