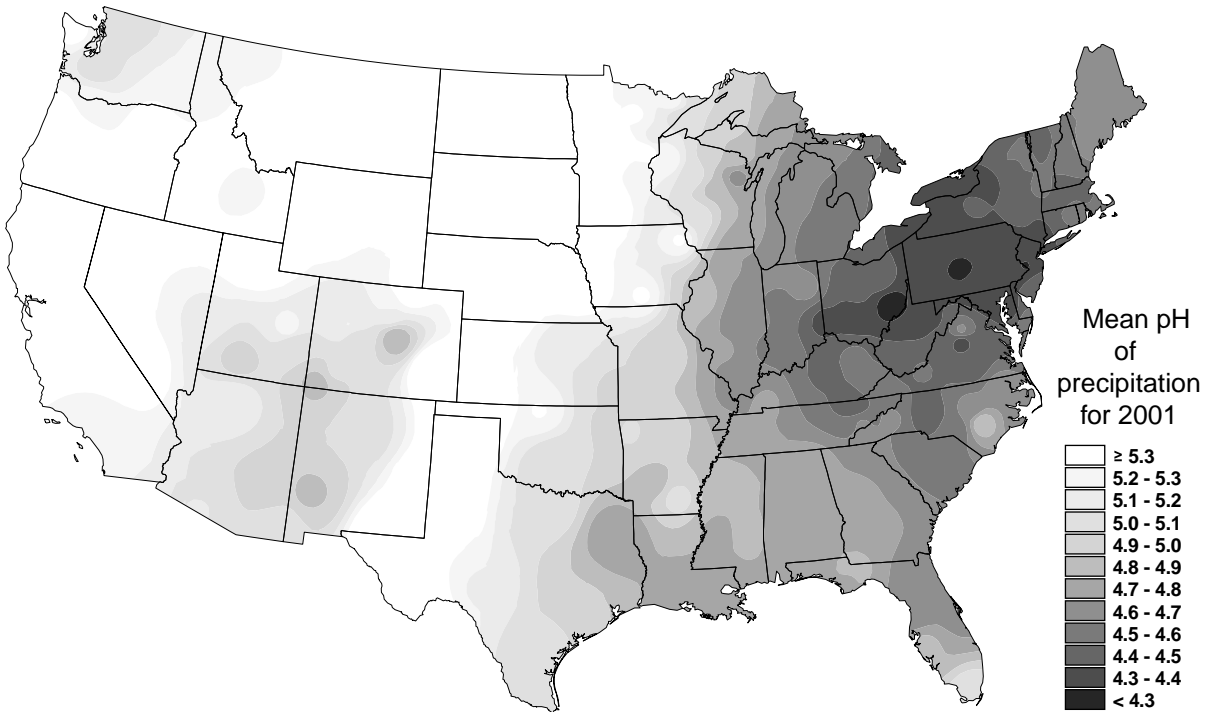


ACID RAIN: ARE THE PROBLEMS SOLVED?

MAY 2-3, 2001 WASHINGTON D.C.
CONFERENCE PROCEEDINGS



Sponsored and Organized by the

Center for Environmental Information Inc.

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Preface

Acid rain was first recognized as a serious threat to the environment in the 70s, but public concern about the issue decreased with passage of the Clean Air Act Amendments of 1990 and the emerging awareness of global climate change. As the papers in these proceedings attest, however, the problem is still of major importance. This conference was needed to highlight the continued damage to our environment, documented by monitoring and research findings since the 1990 Clean Air Act amendments, and to reveal the changing face of the problem as regulation, science, and technology have or have not been applied.

The conference brought together those whose research, policymaking, enforcement, and implementation actions are affecting acid deposition. New knowledge and appreciation of the significant role of nitrogen, and especially ammonia, largely from food production, is presented from several points of view, along with the story of the unexpectedly cost-effective success of the emissions trading program.

Many speakers emphasized that, based on research and monitoring, the Clean Air Act Amendments of 1990 were inadequate to control

the adverse effects of acid deposition and that additional reductions in emissions are a pressing and immediate need if damage is to be slowed and recovery possible. Others emphasized the severe and costly public health effects associated with acid rain precursors.

We were especially fortunate to have several members of the U.S. Senate and House of Representatives on the program, and active in the hearing of the House Science Committee held in conjunction with the conference.

The Steering Committee's excellent work in designing the program and selecting speakers who were authorities in their field is reflected in the outstanding quality of the presentations.

We gratefully acknowledge the support of the 54 co-sponsors of the conference and the proceedings.

Special thanks go to John Terninko who acted as conference and publication coordinator and to Shirley Sherman who was responsible for the registration and support services. The conference and these proceedings would not have happened without the initiative and organizational skills of Liz Thorndike.

James C. White, Ph.D
Editor
July, 2002

About the Center

The **Center for Environmental Information** (CEI) is a private, nonprofit, educational organization, founded in Rochester, New York, in 1974. CEI provides information and communication services, publications, and educational programs in order to:

- Advance public understanding of environmental issues;
- Act as a communication link among scientists, educators, decision makers and the public;
- Advocate informed action based on the free exchange of information and ideas.

CEI and Acid Rain

In 1980, New York Senator Patrick Moynihan sponsored legislation creating the National Acid Precipitation Assessment Program (NAPAP), a cooperative federal research, monitoring and assessment effort. The Program was intended to address the acid rain problem which scientists had been documenting for some years (1979, "Acid Rain", *Scientific American*, Likens, Wright, Galloway, Butler, Vol. 241, No.4, pp.43-51).

In 1982, with New York State's Adirondack Park the bullseye of the acid rain problem, CEI established the Acid Rain Information Clearinghouse (ARIC). For eight years ARIC served as a central information, education and communication link among scientists, decision makers, environmental organizations, educators and the public. With a distinguished international advisory council, ARIC initiated, edited and disseminated the monthly bulletin, *Acid Precipitation Digest*; organized conferences and educational programs in New York and Washington, D.C.; published and disseminated conference proceedings; served as Documentation Center for the New York-Quebec Acid Rain Agreement; helped create a bi-lingual database (ACIDOC) on acid rain research and policy; identified 708 research, monitoring and assessment projects, in addition to the NAPAP program, being carried out by 25 states and 56 private and non-governmental organizations, thus verifying the scope and magnitude of attention being given to this problem; and established a

library and information and referral service known internationally. By 1990 the ARIC acid rain collection included over 6000 publications.

In 1984, ARIC's first major conference, "Acid Rain: A New York State Agenda", held in Albany, was followed by passage of the first state Acid Deposition Control Act. Subsequent conferences in Albany and in Washington, D.C., organized until passage of the 1990 Clean Air Act Amendments, were entitled "Acid Rain: Economic Assessment"; "Liming Acidic Waters: Environmental and Policy Concerns"; "Acid Rain: The Relationship Between Sources and Receptors"; "Acid Rain: The View From The States"; "Global Climate Change Linkages: Acid Rain, Air Quality, and Stratospheric Ozone"; "Acid Rain Research in New York State".

Passage of the 1990 Clean Air Act Amendments and a shift of attention to ozone depletion and global climate change, diminished acid deposition as an issue in the public eye. Important new research information from regions around North America has brought the acid rain issue to the forefront again.

For 26 years the Center for Environmental Information has acted as a catalyst to advance the public agenda toward soundly conceived, scientifically-informed environmental policies. The 2001 acid rain conference is another milestone along that path.

Conference Steering Committee

Ed Bennett – New York State Department of
Environmental Conservation
Christopher Bernabo – Collaborative Solutions,
Inc.
Rona Birnbaum – U.S. EPA
Richard Haeuber – U.S. EPA
Kathleen Fallon Lambert – Hubbard Brook
Research Foundation
Leonard Levin – EPRI

Bernard Melewski – Adirondack Council
Mark Nilles – U.S. Geological Survey
Elizabeth Thompson – Environmental Defense
Elizabeth Thorndike – Center for Environmental
Information
Michael Uhart – National Acid Precipitation
Assessment Program
James C. White – Center for Environmental
Information

Conference Co-Sponsors

- * Adirondack Council
- Adirondack Mountain Club
- Air & Waste Management Association
- American Fisheries Society
- American Gas Association
- American Hiking Society
- American Institute of Biological Sciences
- American Lung Association
- American Sportfishing Association
- Appalachian Mountain Club
- Appalachian Voices
- Association for the Protection of the Adirondacks
- Center for Clean Air Policy
- Citizens Campaign for the Environment
- Clean Air Network
- Clean Air Task Force
- Conference of New England Governors and Eastern Canadian Premiers
- * Cornell University Center for the Environment
- * Department of Foreign Affairs and International Trade Canada / Ministère des Affaires Étrangères et du Commerce International du Canada
- Ecological Society of America
- * Edison Electric Institute
- Environment & Energy Study Institute
- * Environment Canada / Environnement Canada
- * Environmental Defense
- * EPRI
- Hubbard Brook Research Foundation
- Izaak Walton League of America
- * Keyspan Foundation
- National Acid Precipitation Assessment Program
- National Audubon Society
- National Council for Science and the Environment
- National Oceanic & Atmospheric Administration, Air Resources Laboratory
- National Trust for Historic Preservation
- * National Wildlife Federation
- Natural Resources Defense Council
- * New York Power Authority
- * New York State Adirondack Park Agency
- * New York State Department of Environmental Conservation, Division of Air Resources
- * New York State Energy Research and Development Authority
- * Niagara Mohawk
- Northeast States for Coordinated Air Use Management
- RAND Corporation
- Residents' Committee to Protect the Adirondacks
- Resources for the Future
- Save Outdoor Sculpture!
- * State University of New York College of Environmental Science & Forestry
- Trout Unlimited
- * U.S. Department of the Interior, Fish and Wildlife Service
- * U.S. Department of the Interior, National Park Service, Air Resources Division
- * U.S. Department of the Interior, National Park Service, PRIMENet
- * U.S. Environmental Protection Agency, Clean Air Markets Division
- * U.S. Geological Survey
- Union of Concerned Scientists
- * World Resources Institute
- * Funding co-sponsor

Conference Program

MAY 2, 2001

Welcome

Elizabeth Thorndike – Center for Environmental Information

Session I. Addressing the Acid Rain Problem – Twenty Years in Retrospect.

Chair: Christopher Bernabo – Collaborative Solutions, Inc.
Brian McLean – U.S. EPA: Federal Legislative and Regulatory Record
Richard Valentinetti – STAPPA: State/Local Legislative and Regulatory Role
John McManus – American Electric Power: Compliance Experience of Regulated Entities

Session II. Research And Analysis: What the Reports Say.

Chair: Bernard Melewski – Adirondack Council
Charles Driscoll – Syracuse University: Acid Rain Revisited: Sources, Effects and Recovery in the Northeastern U.S.
Michael Uhart – NAPAP: National Acid Precipitation Assessment Program Analysis
Rona Birnbaum – Clean Air Markets Division, U.S. EPA: Beyond Title IV: Perspectives on Additional Reductions

Luncheon Speaker

Senator Charles Schumer

Session III. Acid Rain Impacts: State of the Science.

Chair: Mary Barber – Ecological Society of America
Van Bowersox – Illinois State Water Survey: Sources and Receptors: Monitoring the Data
Arthur Bulger – University of Virginia: Freshwater Aquatic Systems
Robert Howarth – Environmental Defense: Coastal Ecosystems
Greg Lawrence – US Geological Survey: Forests and Terrestrial Systems
Morton Lippmann – New York University School of Medicine: Human Health
Mary F. Striegel – National Center for Preservation Training and Technology: Materials and Cultural Resources

Special Program: Acid Rain Information Resources

Fred Stoss – SUNY Buffalo Biological Sciences Librarian: Review significant printed matter, abstracting and indexing services, and internet resources related to acid rain.

Conference Program

MAY 3, 2001

Session IV. Acid Rain Linkages: Ozone, Hazardous Air Pollutants, Particulate Matter, Eutrophication, and Climate Change.

Chair: Tamara Blett – National Park Service
Dr. Paulette Middleton – RAND Corporation:
Overview of the Sources
James Galloway – University of Virginia:
Overview of the Impacts

Session V. North American Regional Impacts Panel.

Chair: Ellis Cowling – North Carolina State University
Richard Poirot – Conference of New England Governors and Eastern Canadian Premiers: Northeast
Douglas Knauer – Wisconsin Department of Natural Resources: Mid-West
Don Campbell – U.S. Geological Survey: Intermountain/West
Brent Takemoto – California Air Resources Board: Southwest
Guy Fenech – Environment Canada: Canada
Ellis Cowling – North Carolina State University: Southeast

Luncheon Speaker

Representative John E. Sweeney

Session VI. Economics of Acid Rain

Chair: John D. Kinsman – Edison Electric Institute
Jeremy Platt – EPRI: Compliance Costs and Markets
Dallas Burtraw – Resources for the Future: Economic Benefits of Controls

Guest Speaker

Senator Hillary Rodham Clinton

Session VII. Hearing of the House Science Committee – In conjunction with the conference (held in the Rayburn Building)

Chair: Representative Sherwood L. Boehlert
Charles Driscoll – Syracuse University: The latest science on air pollution that causes acid rain, ozone and particulates
Ellis Cowling – North Carolina State University: Impacts of air pollution on forests, fish, and surface and ground water quality in the Southeast and the importance of monitoring networks
Jill Baron – Colorado State University: The impacts of nitrogen deposition in the Colorado Front Range
Jerry Keeler – University of Michigan: Our evolving understanding of the sources of mercury pollution, mercury's fate in the environment, and future research and monitoring needs

2001 Acid Rain Conference Proceedings

The response to acid rain has thus far been a story of the system succeeding—a story of Congress acting on the basis of the best research, even in the face of uncertainty, and then trying to update policy on the basis of continuing research. That's a pattern we need to perpetuate. We need to keep funding the research and heeding its results.

Congressman Sherwood Boehlert (R-NY)
*Opening Statement, Acid Rain Hearing
House Science Committee, May 3, 2001*

Introductory Message

The 29 papers and presentations in these proceedings include the most comprehensive and most authoritative information on the topic of acid rain and its linkages presented to date in a public forum. Included are the results of new research findings since enactment of the 1990 Clean Air Act Amendments, recent monitoring data, economic analyses, and political perspectives. The magnitude of the health benefits alone, compared to the costs of controls, makes the case for the value of reduced emissions.

The conference was convened in May, 2001 to put the acid rain problem – continental in scope – squarely back on the forefront of the public agenda. Conference participants came from 24 states, the District of Columbia and Canada. Conference co-sponsors included 54 federal and state agencies, organizations, associations, institutions, and companies.

The Executive Summary of the conference was sent to members of Congress and key administration officials in July, 2001. Since then, various legislative bills and initiatives have been put forward by members of Congress and the Administration to address acid rain and linked problems

such as mercury accumulation, particulate matter, over-fertilization of ecosystems (nitrogen saturation), ozone formation, and climate change.

Each of these mounting problems has a common source--combustion of fossil fuels used in transportation and for electric generation – joined by emissions of ammonia from food production. The impact of these growing emissions is now regarded by scientists as a cascade of effects on health, visibility, forests, soils, groundwater, streams, rivers, and coastal ecosystems, as well as a cause of increased concentrations of potent greenhouse gases globally. As Dr. James Galloway of the University of Virginia notes, "Linkages among effects require a multi-pollutant strategy for control."

Mobile and point sources, both parts of the problem, must now become part of the solution. Deployment of existing and emerging energy efficiency technologies and strategies, along with alternative energy sources, can lead the inevitable transition to cleaner sustainable energy resources which are critical to our economic vitality, competitive edge, and quality of life.

Elizabeth Thorndike
Center for Environmental Information
July, 2002