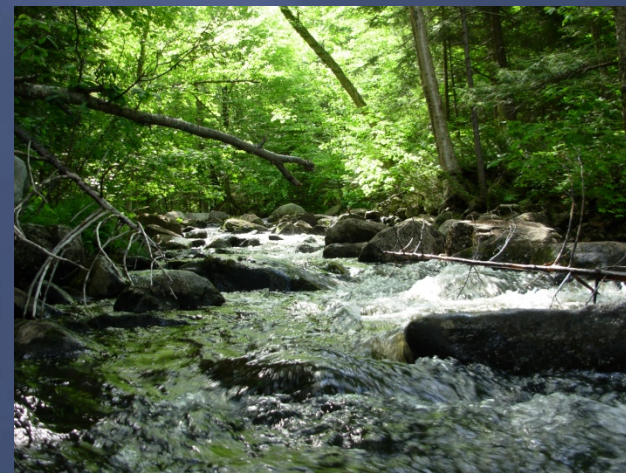


NYSERDA



Research Projects Related to the Impact of Sulfur, Nitrogen and Mercury Deposition on Ecosystems



Recently Extended Projects

Adirondack Long-Term Monitoring

- Adirondack Lakes Survey Corporation, NYS Department of Environmental Conservation, US Geological Survey, Syracuse University

Mercury Deposition Monitoring in the Catskills

- US Geological Survey, Frost Valley YMCA

Mercury Monitoring in the Common Loon

- Wildlife Conservation Society's Adirondack Loon Conservation Program, Biodiversity Research Institute, Calvin College



Strategic Monitoring of Mercury in NYS Fish

- NYS Department of Environmental Conservation



New Research Projects





Critical Loads of Sulfur & Nitrogen Deposition to Protect & Restore Acid-Sensitive Resources in the Adirondacks

Objective 1: Determine the portions of the Adirondacks where acidified lakes and forest soils can recover

Objective 2: Estimate the long-term deposition load that would be required for such a recovery

Objective 3: Characterize landscapes which may require additional remediation beyond deposition reduction



E&S Environmental Chemistry, Syracuse University,
University of Virginia, US Geological Survey

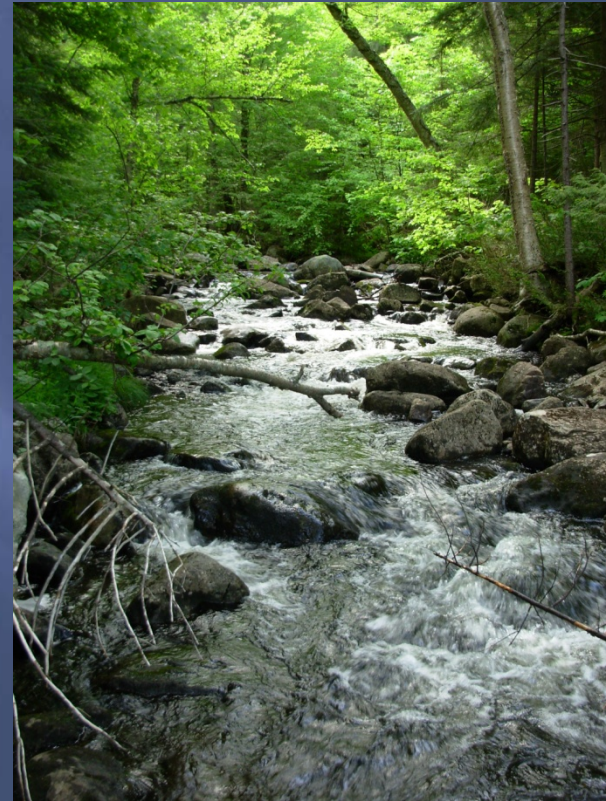


Empirical Estimation of the Critical Load for Inorganic Aluminum Mobilization in the Western Adirondacks

Objective 1: Determine the CL for Al mobilization for 188 WASS watersheds

Objective 2: Extrapolate results to the entire Oswegatchie-Black River Basin areas

Objective 3: Estimate time required for cessation of inorganic Al mobilization in watersheds exceeding CL at various deposition levels.



Cary Institute of Ecosystem Studies, US Geological Survey, E&S Environmental Chemistry Inc.

Acid Deposition Effects on Adirondack Ecosystems: Linkages Among Streams, Soils, & Sugar Maple Health

Objective: Assess the effects of acidic deposition on growth, health and reproduction of maple trees

Objective : Quantify the extent to which sugar maple health is associated with soil conditions un upland watersheds

Objective : Determine if stream chemistry can be used to infer terrestrial effects



E&S Environmental Chemistry Inc., US
Geological Survey, US Forest Service



Deacidification: Dissolved Organic Carbon & Nitrate Export -- Identifying Connections



Objective 1: Assess whether changing acidification affects the release of DOC and bDOC from soil

Objective 2: Assess if variation in stocks of soil C and release of bDOC provide strong regulation of nitrate export from forest catchments



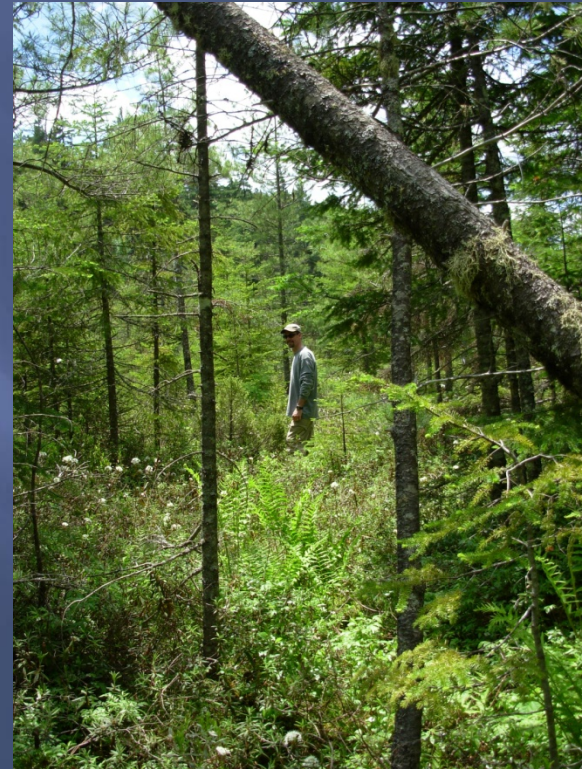
Investigating Interactions Between Carbon, Nitrogen, & Calcium in the Adirondack Forest (Ph.D. Fellowship)

Objective 1: Identify changes in C and N stocks in forest floor and mineral soils

Objective 2: Assess the influence of Ca on forest floor decomposition

Objective 3: Assess forest health with increased Ca availability

Objective 4: Assess changes in N-cycling in response to Ca availability



Cornell University



Evaluation & Protection of Adirondack Ecosystems: Impacts of Acid & Mercury Deposition on Watersheds

Objective 1: Evaluate the sources of internal watershed S and drainage water sulfate losses

Objective 2: Understand importance of snowpack development and soil freezing on watershed nitrate export.

Objective 3: Understand connections between deposition and discharge of sulfate, nitrate, DOC, Al and Hg as influenced by climate and watershed moisture

Objective 4: Better understand the linkages between Hg deposition and climate that effect Hg species transport through hydrologic flow paths and net MeHg production within forested ecosystems.

SUNY Environmental Science and Forestry,
Syracuse University, University of Calgary





Land Atmosphere Dynamics of Mercury & Ecological Implications for Adirondack Forest Ecosystems

Phase 1 - Hg measurement and monitoring

- Continue with MDN Monitoring
- Continue with EPA Hg Monitoring
- Quantify pool and fluxes of Hg in deciduous and Coniferous plots
- Compare 3 estimate techniques of dry deposition



Phase 2 - Infer spatial patterns of Hg Dep across the Adirondacks

- Measure foliar and soil Hg from a number of diverse plots
- Estimate deposition using GIS model (Miller et al. 2005)
- Test model using measured soil/foliar Hg
- Develop series of GIS layers (wet, gaseous and dry Hg dep)

Syracuse University,
Clarkson University



The Production & Transfer of Methylmercury Within Terrestrial Food Webs Across the Northeastern Lands (Ph.D. Fellowship)

Objective 1: Investigate trophic transfer of MeHg within invertivor food-webs in Adirondack sphagnum bogs and hardwood forests through new sampling

Objective 2: Synthesis and analyze new and existing data on biotic and abiotic Hg levels in terrestrial food-webs to better characterize the mechanisms



Next EMEP Solicitation Proposals due Spring 2009

PON 1292 - "Acid Deposition, Mercury Research and Synthesis"

- \$1,000,000 in EMEP funds available
- Projects capped at \$250,000 in EMEP funds
- Anticipate proposals due in May 2009
- Two two-year fellowships (\$20,000/yr)
- Encourages interdisciplinary teams (environmental researchers, economists, social scientists, public policy analysis etc.)



PON 1292

“Acid Deposition, Mercury Research and Synthesis” Four Key Solicitation Topics

Topic 1: Ecosystem Economic Valuation

- How has acid and Hg deposition impacted the economy in NYS and what would ecosystem recovery mean in economic terms
- Begin to tie what is known about environmental impacts and recovery to economics and other human activities



PON 1292

“Acid Deposition, Mercury Research and Synthesis” Four Key Solicitation Topics

Topic 2: Mercury Biogeochemical Processes

- How has Hg impacted estuarine, coastal and marine ecosystems in New York
- What factors influence production of MeHg in these systems



PON 1292

“Acid Deposition, Mercury Research and Synthesis” Four Key Solicitation Topics

Topic 3: Ecosystem Impacts and Recovery from S & N Deposition

- Linking chemistry and biota
- Chronic and episodic stream survey/monitoring
- Concurrent stressors (climate change, invasives etc.)
- Accelerated recovery, especially biota and forests



PON 1292

“Acid Deposition, Mercury Research and Synthesis” Four Key Solicitation Topics

Topic 4: Synthesis of Acid Deposition and Mercury Data to Better Inform Policy

- Synthesis work to identify gaps in knowledge and future needs
- Synthesis work to better disseminate data and understanding of ecosystem impacts





Questions?

