

ANNUAL REPORT: June 1, 2010 – May 31, 2011
(i.e., Summer 2010, AY 2010-2011)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: Myron J. Mitchell

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

	Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
SUMMER:					
FALL:	EFB 415	Ecological Biogeochemistry	3	22	
	EFB 610	Ecological Biogeochemistry	3	8	
	Also, 13 CIE students participated				
SPRING:					
	EFB 497	Ecology Seminar	1	3	
	EFB 797	Hydrology/Biogeochemistry Seminar	1	16	

NOTE: PLEASE INDICATE WHICH COURSE(S) HAD A SERVICE-LEARNING COMPONENT AND BRIEFLY EXPLAIN THE NATURE OF THIS COMPONENT. For examples of service-learning in courses, see: <http://www.esf.edu/students/service/courses.htm>. Service-learning is a form of structured experiential education in which students engage with the community to be active learners, to enrich their sense of civic responsibility, and to explore practical application for course content. Faculty oversight, reflective thinking, and reciprocity are key components of service-learning. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

Course No.	Title	Credit Hrs.	No. Students
EFB 498	Group Seminar	1	3
EFB 798	Group Seminar	1	3
EFB 899	MS Thesis	5	1

3. Continuing Education and Extension (short courses, workshops, etc.)

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
EFB 120	Global Environment and Human Culture	1

II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor 16 and unofficial advisor _____
- B. Graduate Students: (Name, degree sought, starting date, month & year; if a degree was completed, please give date and full citation for the thesis or dissertation).

MAJOR PROFESSOR

Phil-Goo Kang, Ph.D. (Major professor) (August 2007)
Shannon Buckley, Ph.D. (Major Professor) (June 2008)

CO-MAJOR PROFESSOR

Daniele Baker, M.S. (Co-Major Professor) (August 2008)

MEMBER, STEERING COMMITTEE (other than those listed above)

Hector Abegbidi (Forestry, Ph.D.)
John Cole (Civil and Envir. Engin, M.S.)
Jason Dittman (Civil and Envir. Engin, Ph.D.)
Colin Fuss (Civil and Envir. Engin, Ph.D.)
Jacob Gillette (EFB, Ph.D.)
Xinli Ji
Wei Le (Civil and Environ. Engin., Ph.D.)
Lisa Kurian (M.S., Forest Resources Management).
Jing Zhai
Devi Mateti (Civil and Envir. Engin).
Dorothy Richey (Civil and Environ. Engin.)
Pranesh Selvendiran (Civil and Environ. Engin., Ph.D.)

Madeline Turnquist (EFB, MS)

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Jason Townsend (Ph.D.)

III. RESEARCH COMPLETED OR UNDERWAY

A. Departmental Research (unsupported, boot-legged; title - % time spent)

B. 1. Grant-supported Research (source, subject, amount - total award and current year, award period starting and ending dates; list graduate research assistants supported by each grant)

Co-Investigator. Long-Term Ecological Research (LTER) at Hubbard Brook Experimental Forest (HBR) (MJ Mitchell, \$90,000) 2011-2016.

Co-Investigator. Nitrogen (N) Availability as Driver of Methylmercury Production in Forested Soils and Stream Sediments. New York State Water Resources Institute (WRI). \$20,000. 2011-2012.

Principal Investigator. Collaborative Research: Winter Climate Change in a Northern Hardwood Forest. NSF Ecosystems. \$179,149. 2010-2013.

Co-Investigator. Impacts of Acidic Deposition and Soil Calcium Depletion on Terrestrial Biodiversity and Food Webs in Northern Hardwood Forest Ecosystems. NSRC, Theme 2: Sustaining Ecosystem Health in Northern Forests. \$141,488. 2010-2012.

Co-Investigator. Positioning Rust-Belt Cities for a Sustainable Future: A Systems Approach to Enhancing Urban Quality of Life. NSF ULTRA-Ex. \$300,000. 2010-2012

Co-Investigator. Importance of calcium-rich substrates for supporting refugia of biodiversity and productivity in an increasingly acidified landscape. Northern States Research Cooperative (Theme 4: Biodiversity and Protected Area Management). \$41,543. 2009-2010.

Principal Investigator. Collaborative Research: Evolution of Dissolved Organic Nitrogen (DON) from the Headwaters to the Catchment Outlet: Sources, Variation with Scale, and Differences with DOC. NSF-Hydrology. \$70,256.00. 2008-2011

Principal Investigator. Evaluation and Protection of Adirondack Ecosystems: Impacts of Acid and Mercury Deposition on Watersheds. NYSERDA-EMEP. \$453,568. 2008-2012.

Principal Investigator. Hydroclimatic effects on ecosystem response: A synthesis of long-term results from watersheds in the northeastern United States and southeastern Canada. NSRC/NERC U.S. Forest Service. \$146,000. 2007-2011.

Principal Investigator. Characterization of ambient air quality in Syracuse, NY and identification of its origins. CARTI -Collaborative Activities for Research and Technology Innovation. Total \$600,000 (\$200,000 SUNY-ESF). 2007-2011.

Co-Investigator. The Impact of Changing Climate on Winter Nitrogen Export from a Forested Watershed of the Adirondack Mountains. McIntire-Stennis (\$81,230) 2007-2010.

2. Research Proposals pending (include information as in B.1., above).

3. Research Proposals submitted, but rejected (include information as in B.1., above)

IV. PUBLICATIONS (Full bibliographic citation, i.e., do not use "with Jones," or "Jones, et al."; please list only publications published, in press, or actually submitted during this reporting period --- **do not list manuscripts in preparation**).

A. Refereed Publications

Buckley, S.M. and M.J. Mitchell. 2011. Improvements in Urban Air Quality: Case Studies from New York State, U.S.A. *Water, Air and Soil Pollution* 214:93-106

Inamdar, S., N. Finger, S. Singh, M. Mitchell, D. Levia, H. Bais, D. Scott and P. McHale. 2011. Dissolved organic matter (DOM) concentration and quality in a forested mid-Atlantic watershed, USA. *Biogeochemistry*. In Press.

Inamdar, S., S. Singh, S. Dutta, D. Levia, M. Mitchell, D. Scott, H. Bais, and P. McHale. 2011. Fluorescence characteristics and sources of dissolved organic matter for stream water during storm events in a forested mid-Atlantic watershed. *Journal of Geophysical Research Biogeochemistry* (In Press).

Levia, D., J. Van Stan, C. Siegert, S. Inamdar, M.J. Mitchell, S. Mage and Patrick McHale. 2011. Atmospheric deposition and corresponding variability of stemflow chemistry across temporal scales in a mid-Atlantic broadleaved deciduous forest *Atmospheric Environment* 45:3046-3054.

Mitchell, M.J. 2011. Nitrate Dynamics of Forested Watersheds: Spatial and Temporal Patterns in North America, Europe and Japan. *Journal of Forest Research*. (In Press)

Mitchell, M.J. and G.E. Likens. 2011. Watershed Sulfur Biogeochemistry: Shift from Atmospheric Deposition Dominance to Climatic Regulation. *Environmental Science and Technology* (In Press).

Mitchell, M.J., G. Lovett, S. Bailey, F. Beall, D. Burns, D. Buso, T. A. Clair, F. Courchesne, L. Duchesne, C. Eimers, D. Jeffries, S. Kahl, G. Likens, M.D. Moran, C. Rogers, D. Schwede, J. Shanley, K. Weathers and R. Vet. 2011. Comparisons of Watershed Sulfur Budgets in Southeast Canada and Northeast US: New Approaches and Implications. *Biogeochemistry* 103:181-207.

Wang H., Wang R., Yue Y, Mitchell M.J., and Zhang L. 2011. Variability of Soil Organic Carbon after Freshwater Restoration in Degraded Wetlands of the Yellow River Delta, China. *Journal of Environmental Management* (In Press)

Christenson, L.M., Mitchell, M.J., Groffman, P.M. and Lovett G.M. 2010. Winter climate change implications for decomposition in Northeastern forests: comparisons of sugar maple litter to herbivore fecal inputs. *Global Change Biology* 16: 2589-2600 .

Hubbard, K.A. , L. K. Lautz, M. J. Mitchell, B. Mayer and E. R. Hotchkiss. 2010. Evaluating nitrate uptake in a Rocky Mountain stream using labeled ¹⁵N and ambient nitrate chemistry. *Hydrological Processes* 24: 3322-3336.

Jin, L., Siegel, D.I., Lautz, L.K., Mitchell, M.J., Dahm, D.E. and Mayer, B. 2010. Calcite precipitation driven by the common ion effect during groundwater-surface water mixing: a potentially common process in streams with geologic settings containing gypsum. *The Geologic Society of America Bulletin* 122: 1027-1038,

Mayer, B., J.B. Shanley, S.W. Bailey and M.J. Mitchell. 2010. Identifying sources of streamwater sulfate after a summer drought in the Sleepers River watershed (Vermont, USA) using hydrological, chemical, and isotope techniques. *Applied Geochemistry* 25(5): 747-754 .

Park, J-H, B. Kim, D. Lei, M.J. Mitchell, and H. Shibata. 2010. Potential effects of climate change and variability on watershed biogeochemical processes and water quality in northeast Asia. *Environmental International* 36:212-225.

Puntsag, T., J.S. Owen, M.J. Mitchell, C.E. Goulden, and P.J. McHale. 2010. Patterns in solute chemistry of six inlet streams to lake Hövsgöl, Mongolia. *Journal of Ecology and Field Biology* 33: 289-298.

B. Non-refereed Publications

B. Papers Presented at Science Meetings (give title, date, occasion, and location)

Gave Invited presentations:

Temperate Forest Watersheds: Responses to Atmospheric Pollutants and Climate Change at Jinang University (Jinang, China) on October 12, 2010

Nitrogen Biogeochemistry of Forested Catchments: Importance of Winter Processes at Chinese Academy of Sciences (Beijing, China) on October 20, 2010

Hydrobiogeochemical Research at the Huntington Forest: Effects of Atmospheric Deposition and Climate Change at meeting in Newcomb, NY on Source to Sink: Hudson River Watershed Research and Education Meeting on Oct. 1-2, 2010

D. Public Service Presentations (lectures, seminars, etc. to and for the public; give group or occasion, date(s), and attendance)

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local):

Member of the EPA's Clean Air Scientific Advisory Committee (CASAC)

2. Industrial and Commercial Groups, etc.

B. Unfunded Service to Governmental Agencies, Public Interest Groups, etc.

Board of Directors of Upstate Freshwater Institute

Member of Finance Committee of Upstate Freshwater Institute

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)

B. 1. Activities in Professional Organizations (offices held, service as chairman, member, participant or consultant)

Member of International Scientific Steering Committee of the 8th International Conference on Acid Deposition to be held in Beijing, China, June 2011

Chair of Hubbard Brook Experimental Forest Archive Committee

2. Professional Society Membership

American Association for the Advancement of Science (Fellow)

American Geophysical Union

Ecological Society of America

Sigma Xi

Soil Science Society of America

3. Other Professional Activities

a. Editorial activity

Journal (s)

Responsibility

Other (books, symposia, etc.)

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Biogeochemistry	3
Canadian Journal of Forest Research	1
Science of the Total Environment	1

<u>Agency</u>	<u>No. of proposals</u>
Greek Ministry of Education Research Proposal	1
National Science Foundation, Hydrological Sciences	1
Natural Science and Engineering Research Council of Canada	2
University of California Kearney Foundation	1
SUNY-ESF "Seed Proposal"	2
<u>Other</u>	
Reviewed National Park Service "Report on Northeast U.S. Critical Loads Project".	
US EPA Internal Paper Review	1

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
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Workshop Organizer and Presenter:

NSRC workshop #2: Hydroclimatic effects on ecosystem response: A synthesis of long-term results from watersheds in the northeastern United States and southeastern Canada, Peterborough, Ontario, Canada, September 24, 2010. Presentation entitled: Nitrate dynamics of forested watersheds in the winter: Conceptual model and statistical approaches

C. Further Education/Re-training Undertaken, Leaves, Workshops, etc.

C. Foreign Travel (Where, When, Purpose)

Invited lectures on air pollution and biogeochemistry at Jinang University and Chinese Academy of Sciences (Beijing). Oct. 11-20, 2010

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

B. College-level

Director of Council of Hydrologic Systems Science

C. University-wide, including Research Foundation

Consortium of Universities for the Advancement of Hydrologic Sciences, Incorporated (CUAHS), alternate representative for ESF (2001-present).

NYSTAR Team Leader for Urban Ecosystems.

Member of Board of Directors of New York Research Foundation

Vice-Chair of Board of Directors of New York Research Foundation (January 2011-present)

Chair and Member of Committee on Research for New York Research Foundation (Jan.- Dec. 2010)

Chair and Member of Committee on Human Resources for the New York Research Foundation (January 2010 - present).

Member of SUNY Higher Education Advisory Committee

Reviewer Committee for SUNY Distinguished Professors

VIII. SUMMARY OF SIGNIFICANT ACTIVITIES AND ACCOMPLISHMENTS DURING THIS REPORTING PERIOD, ESPECIALLY THOSE MOST NOTEWORTHY AND RELATIVE TO THE COLLEGE'S AND DEPARTMENT'S MISSION. One paragraph on each of the following would be most helpful: this past year, what have you done for our students, department/college, and self professionally? NOTE: The information in this section (along with the supporting specific information elsewhere in this report) should be your strongest case for being considered for a discretionary raise, which I'll continue to award based on your contributions to the department and college this reporting period.

My contribution to students has focused on the support and development of our program related to water resources. We are currently working on a new updated web page on water programs at ESF. This past spring we had a successful seminar entitled "Cross-Disciplinary Seminar in Hydrological and Biogeochemical Processes" with 73 participants including faculty members, staff and students. I also have employed four undergraduate students in my laboratory. I currently have three graduate students (2 Ph.D.; 1 M.S.). I will take on two new graduate students this coming fall including Tamir Puntsag who is coming from Mongolia with support from the Fulbright Foundation.

Over the past year a substantial portion of my time and energy has been devoted to SUNY wide efforts. I am a member of SUNY Research Foundation Board and currently was elected to Vice-Chair in January 2011. Hence I now serve on the Executive Committee. The RF Board has been active in a number of areas including a revision of bylaws and various matters associated with research operation across the SUNY system. These activities necessitate regular trips to Albany and numerous conference calls. I also serve as a member of the SUNY Distinguished Professors Committee which includes reviewing nominations.

I have continued to maintain a vigorous research program with more than \$1.4 million in grants. I am also the lead scientist in maintaining the funding and infrastructure for atmospheric deposition and watershed analyses at the

Huntington Forest in the Adirondack Mountains. I have been able to arrange through the Syracuse CoE the hiring of a technical support position (Geoffrey Millard) who is being paid 50% by Syracuse University and 50% by ESF. This support position is critical since David Lyons who has worked with me for 12 years is moving to California this summer. During the period of this report I authored or coauthored fourteen peer-reviewed papers. I am currently engaged in an effort synthesizing data on nitrogen biogeochemistry for a broad range of sites across southeastern Canada and the northeastern United States. The results of this work will be linked to changes in atmospheric deposition and climate change. Another major research effort is associated with the measurements of carbon dioxide fluxes at two sites (Upper Onondaga Park and the Syracuse Center of Excellence Headquarters). I am on the organizing committee for the International Acid Rain meeting to be held in Beijing in June 2011. I helped formulate a cooperative agreement between Jinan University in China and SUNY-ESF.

IX. A. FUTURE PLANS, AMBITIONS, AND POTENTIAL CONTRIBUTIONS FOR YOUR OWN PROFESSIONAL DEVELOPMENT AND THE ENHANCEMENT OF THE PROGRAM IN ENVIRONMENTAL AND FOREST BIOLOGY (brief summary)

Maintain current level of effort.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2009

a. Course(s) to be offered

b. Proposed research activity

I will continue my various research efforts that include air pollution/meteorological monitoring in the City of Syracuse, continued activity at the Huntington Forest and continued efforts at Hubbard Brook.

c. University, professional society, and public service

I will continue to serve in various capacities to ESF, SUNY and the Research Foundation.

2. Fall Semester 2009

a. Course(s) to be offered

Ecological Biogeochemistry

b. Proposed research activity

I will continue my various research efforts that include air pollution/meteorological monitoring in the City of Syracuse, continued activity at the Huntington Forest and continued efforts at Hubbard Brook.

c. University, Professional society, and public service

I will continue to serve in various capacities to ESF, SUNY and the Research Foundation.

3. Spring Semester 2010

a. Course(s) to be offered

Ecology Seminar

Cross-disciplinary Seminar in Hydrological and Biogeochemical Processes

b. Proposed research activity

I will continue my various research efforts that include air pollution/meteorological monitoring in the City of Syracuse, continued activity at the Huntington Forest and continued effort at Hubbard Brook.

c. University, professional society, and public service

I will continue to serve in various capacities to ESF, SUNY and the Research Foundation.