

ANNUAL REPORT: June 1, 2012 – May 31, 2013
(i.e., Summer 2012, AY 2012-2013)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: Myron J. Mitchell

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>	<u>No. of Lab. Sections</u>
-------------------	--------------	--------------------	---------------------	-----------------------------

SUMMER:

FALL:

EFB 415	Biogeochemistry	29 students	3 credit hours
---------	-----------------	-------------	----------------

EFB 610	Biogeochemistry	10 students	3 credit hours
---------	-----------------	-------------	----------------

SPRING:

EFB 797 Hydrology/Biogeochemistry Seminar	18 students 1 credit hour
---	---------------------------

(This seminar had an average attendance of ~50 individuals including students, staff and faculty with a total participation of ~80 individuals)

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.

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

<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>
-------------------	--------------	--------------------	---------------------

Fall 2012				
EFB 498			1 student	3 credit hours
EFB 797	Seminar		1 student	1 credit hour
EFB 899			2 students	4 credit hours
EFB 999			1 student	1 credit hour
ENS 999			1 student	2 credit hours

Spring 2013

EFB 899			2 students	4 credit hours
EFB 999			1 student	1 credit hour
ENS 999			1 student	2 credit hours

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	2

Seminar on communication and science, March 29, 2013.

II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student's official advisor 15 and unofficial advisor _____

B. Graduate Students: (list 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

Shannon Buckley, Ph.D. (Major Professor) (June 2008), Graduated May 2012 (TOWARDS A GREATER UNDERSTANDING OF THE URBAN CARBON CYCLE: VARIATIONS OF ATMOSPHERIC CO₂ FLUXES WITHIN SYRACUSE, NEW YORK, USA)

Laura Hartley, M.P.S. (Major Professor) (January 2008)

Phil-Goo Kang, Ph.D. (Major Professor) (August 2007)

Tamir Puntsag, Ph.D. (Major Professor) (August 2011)

CO-MAJOR PROFESSOR

Ceili E Bachman, M.S. (Major Professor) (August 2011)

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

MEMBER, STEERING COMMITTEE (other than those listed above)

Andrew Brainard (EFB, Ph.D.)
Monica Berdugo (EFB, Ph.D.)
Whitney Calton ((M.S., Forest Resources Management)
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.)
Gordon Gross (M.S., Forest Resources Management)
Xinli Ji (Civil and Environ. Engin.)
Wei Le (Civil and Environ. Engin., Ph.D.)
Devi Mateti (Civil and Envir. Engin).
Renato Pecaldo (Ph.D. Forest Resources Management)
Dorothy Richey (Civil and Environ. Engin.)
Pranesh Selvendiran (Civil and Environ. Engin., Ph.D.)
Cheryl A Whritenour (Ph.D.)
Xue Yu (Civil and Environ. Engin., Ph.D.)
Yang Yang (Ph.D. Forest Resources Management)
Qunito Zhou (Civil and Environ. Engin., Ph.D.)
Jing Zhai (Civil and Environ. Engin., Ph.D.)

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Lakshmi Rakesh K. Yasarla (PBE Bioprocess Engineering, 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)

Principal Investigator. Monitoring of an Adirondack Ecosystems: Impacts of Acidic and Mercury Deposition and Climate Change on Watersheds NYSERDA \$497,176. 2013-2017.

Co-Investigator. Determination of Climatic and Geomorphological Drivers of Greenhouse Gas Emissions in Forested Landscapes of the US Northeast. McIntire-Stennis. \$77,807. 2012-2015

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.

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

Co-Investigator. NOAA Coastal and Marine Habitat Restoration Project Grants under the American Recovery and Reinvestment Act, "Recovery Act – Coastal Fisheries Habitat Restoration in the St. Lawrence River (\$202,317 subcontract to ESF) of \$1,086,010 Ducks Unlimited. 2011-2013. RA for Ceili Bachman.

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

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

Inamdar, S., G. Dhillon, S. Singh, S. Dutta, D. Levia, M. Mitchell, J. Van Stan, D. Scott, P. McHale. 2013. The controls of end-member chemistry and hydrologic conditions on the temporal patterns of runoff in a forested, Piedmont catchment. *Water Resources Research* (In Press).

Kang, P.G. and M.J. Mitchell. 2013. Bioavailability and size-fraction of dissolved organic carbon, nitrogen, and sulfur at the Arbutus Lake watershed, Adirondack Mountains, NY. *Biogeochemistry* (In Press).

Kurian, L.M., L. K. Lautz and M. J. Mitchell. 2013. Winter hydrology and concentrations in a forested watershed: a detailed field study in the Adirondack Mountains of New York. *Journal of the American Water Resources Association* 49: 264–283.

McEathron, K.M., M. J. Mitchell and L. Zhang. 2013. Acid-base characteristics of the Grass Pond watershed in the Adirondack Mountains of New York State, USA: interactions between soil, vegetation and surface waters. *Hydrology and Earth System Science* (In Press).

Mitchell, M.J., C.T. Driscoll, P.J. McHale, K. M. Roy and Zheng Dong. 2013. Lake-Watershed Sulfur Budgets and Their Response to Decreases in Atmospheric Sulfur Deposition: Watershed and Climate Controls. *Hydrological Processes*. 27:710-720. DOI: 10.1002

Beier, C.M., Woods, A.M., Hotopp, K.P., Gibbs, J.P., Mitchell, M.J., Dovèiak, D., Leopold, D.J., Lawrence, G.B., and Page, B.D. 2012. Variability in gastropod and amphibian communities along a soil calcium gradient in Adirondack northern hardwood forests. *Canadian Journal of Forest Research* 42: 1141-1152

Groffman, P.M., Rustad, L.E., Templer, P.H., Campbell, J.L., Christenson, L.M., Lany, N.K., Soggi, A.M., Vadeboncoeur M.A., Schaberg, P.G., Wilson, G.F., Driscoll, C.T., Fahey, T.J., Fisk, M.K., Goodale, C.L., Green, M.B., Hamburg, S.H., Johnson, C.E., Myron J. Mitchell, M.J. 17, Morse, J.L., Pardo, L.H. and Nicholas L. Rodenhouse, N.L. 2012. Long-Term Integrated Studies Show Complex and Surprising Effects of Climate Change in the Northern Hardwood Forest. *BioScience* 62:1056-1066.

Inamdar, S., N. Finger, S. Singh, M.J. Mitchell, D. Levia, H. Bais, D. Scott and P. McHale. 2012. Dissolved organic matter (DOM) concentration and quality in a forested mid-Atlantic watershed, USA. *Biogeochemistry* 108:55-76.

Inamdar, S. Dhillon G., Singh S., Dutta S., Levia L., Mitchell, M., Van Stan J., Scott, D. and McHale, P.. 2012. Temporal patterns of runoff and the controls of end-member chemistry in a forested headwater catchment. *Water Resources Research* (In press).

Kang, P.G, B. Mayer and M.J. Mitchell. 2012. Comparison of sample preparation methods for stable isotope analysis of dissolved sulfate in forested watersheds. *Isotopes in Environmental & Health Studies*. 48: 410-420.

Kerr, J.G., M. C. Eimers, I. F. Creed, M. B. Adams, F. Beall, D. Burns, J. L. Campbell, S. F. Christopher, T. A. Clair, F. Courchesne, L. Duchesne, I. Fernandez, D. Houle, D. S. Jeffries, G. E. Likens, M. J. Mitchell, J. Shanley and H. Yao. 2012. The effect of seasonal drying on sulphate dynamics in streams across southeastern Canada and the northeastern USA. *Biogeochemistry* 111:393–409 DOI 10.1007/s10533-011-9664-1.

Miles, G.R., M. J. Mitchell, B. Mayer, G.E. Likens and J. Welker. 2012. Long-term analysis of Hubbard Brook stable oxygen isotope ratios of stream water and precipitation sulfate. *Biogeochemistry* 111:443–454 DOI 10.1007/s10533-011-9670-3

Mitchell, M.J. 2012. Research resource review: Forest Hydrology and Biogeochemistry: Synthesis of Past Research and Future Directions. *Progress in Physical Geography* 36:451-453. DOI: 10.1177/0309133312440216/hyp.9670

Van Stan, J. T., D. Levia, S. P Inamdar; M. D Lepori-Bui and M.J. Mitchell. 2012. The effects of phenoseason and storm characteristics on throughfall solute washoff and leaching dynamics from a temperate deciduous forest canopy. *Science of the Total Environment* (in press)

B. Non-refereed Publications

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

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):

- 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)

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

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

<u>Journal (s)</u>	<u>Responsibility</u>
--------------------	-----------------------

<u>Other (books, symposia, etc.)</u>	
--------------------------------------	--

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
-------------------	---------------------------

Biogeochemistry	2
-----------------	---

Environmental Science and Technology	1
--------------------------------------	---

<u>Agency</u>	<u>No. of proposals</u>
National Science Foundation, Hydrological Sciences	3

Other

Greek Ministry of Education Research Proposals	3
SUNY Empire Innovation Program Proposals	25

Reviewed: Draft of NYSERDA ENVIRONMENTAL RESEARCH PROGRAM PLAN on Ecological Effects of Deposition of Sulfur, Nitrogen, and Mercury

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
-------------------------------	-------------	--------------

North Watch (Catchments of the future North: creating science for management in 2050, May 21-25, 2013, Potsdam, Germany. Title of Presentation: "Regulation of sulfur budgets of forest watersheds in the northeastern United States with an Emphasis on the Adirondack Mountains of New York State: Shift from Atmospheric Regulation to Climatic Control

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

D. Foreign Travel (Where, When, Purpose)

Potsdam, Germany, May 21-25, 2012, North Watch Workshop, Gave Invited Presentation

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

B. College-level

Director of Council of Hydrologic Systems Science
 Member of Search Committee for Data Manager for Hubbard Brook LTER (Syracuse University)

C. University-wide, including Research Foundation

Member of SUNY Empire Innovation Advisory Committee
 Member of Board of Directors of New York Research Foundation
 Vice-Chair of Board of Directors of New York Research Foundation (January 2011-present)
 Member of the Committee on Research Supported Economic Development

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 (**i.e., three paragraphs total**) 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 (when available), which I'll continue to award based on your contributions to the department and college this reporting period.

Students

My major teaching commitment in recent years has been associated with an undergraduate and graduate course (Ecological) Biogeochemistry taught jointly as an ESF and SU course with me and Charles Driscoll as instructors. This has been a very successful course and has engaged a broad array of students. Last fall (2012) we had 45 students in this class. I have been responsible for organizing a "Cross-disciplinary Seminar in Hydrological and Biogeochemical Processes." This past spring (2013) we had more than 80 students, faculty and staff who came from academic programs at both ESF and SU that participated in this seminar with an average attendance of 50 individuals. I currently have two Ph.D. students (Phil-Goo Kang, Tamir Puntsag) and two M.S. students (Daniele Baker and Ceili Bachman). For the two M.S. students I am a co-major professor with Kim Schulz. Phil-Goo Kang has had to return to Korea but he is still working on his Ph.D. Dissertation. He has had two chapters of his dissertation published and is working on two additional chapters that will also be published in international journals. He should complete his dissertation in 2013. Tamir Puntsag is supported by a Fulbright Fellowship and is working on project using the stable isotopes of water to analyze the effect of climate change on the hydrology at Hubbard Brook Experimental Forest in NH.

Department/College

I currently serve as Director of Council of Hydrologic Systems Science and also am the alternate ESF representative for the Consortium of Universities for the Advancement of Hydrologic Sciences, Incorporated (CUAHS). My largest current administrative commitments have been involved with the Research Foundation Board on which I serve as Vice-Chair, Member of the Executive Committee and also am a Member of the Committee on Research Supported Economic Development. During this reporting period, I have served in a number of capacities on the Research Foundation Board and also have served on various SUNY committees and tasks forces. Most recently I was a member of the Member of SUNY Empire Innovation Advisory Committee

Self Professionally

I have continued the development of a major research program in biogeochemistry that has focused mostly on the role of air pollutants and climate change on forested watersheds, but has also expanded into other areas including the urban environment and international cooperative work in Asia and Europe. This research has resulted in 14 refereed papers published or in press for this reporting period and research grants totaling \$1,507,937 for this reporting period. The Huntington Forest/Arbutus Lake facility is used by a variety of agencies and current plans are underway to expand this monitoring effort. Most recently NYSERDA has provided funding to cover basic monitoring from 2013-2017. This funding includes \$497,176 in direct funds to ESF. This support also includes annual funds provided directly from NYSERDA for the analytical costs to the National Atmospheric Deposition Program (NADP) for the national trends network (NTN) -(\$5,018), Mercury Deposition Network (MDN) -(\$12,000), Mercury Litter (\$2,600), and atmospheric Hg (\$6,000), for a total of \$128,090 per year in support of deposition and network analyses at the Huntington Forest (HF) over the five (5) years of the project. Additionally, the Passive Ammonia Monitoring network (AMON)

(\$3,100/yr) analytical and network support is paid by EPA and addition Clean Air Status and Trends network (CASTNET) operational cost and analytical costs are paid directly by EPA. Because of the infrastructure and location of this site, the Huntington Forest/Arbutus Watershed has been involved with a broad range of intersite comparisons not only in eastern North America, but also worldwide. The other major research infrastructure that I have helped develop is in the City of Syracuse where we have two towers with one located in a residential area in Upper Onondaga Park for which details can be found at: <http://www.esf.edu/hss/em/onondaga/index.html>. The other tower is located at the Center of Excellence (CoE) Headquarters at a downtown location. We are collecting meteorological data as well as using eddy correlation measurements for determining the fluxes of carbon dioxide, water and heat at both of these sites. In addition at the CoE site we are collecting traffic data from the two adjacent interstate highways (I81 and I690) as detailed: <http://www.esf.edu/hss/em/coe/index.html>. We are also working with the City of Syracuse to install some of our instrumentation in the newly refurbished “fire barn” at Upper Onondaga Park. I have other research projects including being involved with the Long-Term Ecological Study site in New Hampshire. I have been invited to give a keynote address at the meeting of the North American Forest Soil Meeting in June 2013.

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)

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2013

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 2013

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 2014

a. Course(s) to be offered

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 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.