

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

NAME: Martin Dovčiak

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>
FALL:	EFB 535	Flowering Plants: Div., Evol, Syst.	3	9	1
SPRING:	EFB 445	Plant Ecology & Global Change	3	23	-
	EFB 645	Plant Ecology & Global Change	3	19	-

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)

<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>
EFB 498	Resrch Prob / Env.& For. Bio.	4	2
EFB 798	Resrch Prob / Env. & For. Bio.	7	2
EFB 899	Masters Thesis Research	25	5
EFB 999	Doctoral Thesis Research	15	1

3. Continuing Education and Extension (short courses, workshops, etc.) – None.

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
BIO 415/615	Conservation Biology (Syracuse University)	1
EFB 326	Diversity of Plants (SUNY-ESF)	2

II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor 15 and unofficial advisor 2
- 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

Completed students:

1. Michael Lee Davis, M.P.S., May 2011. Identifying shifts in the northern hardwood-boreal ecotone at Whiteface Mountain, Adirondacks, NY.

In Progress:

2. Juan Carlos Alvarez Yepiz, Ph.D., since August 2008 (PhD candidate since May 2011).
3. Portia Osborne, M.S., since August 2009.
4. María Elena Gutiérrez, M.S., since August 2010.
5. Stephen Langdon, M.S., since August 2010.
6. Keith Cardinali, M.P.S., since January 2011.

CO-MAJOR PROFESSOR

In Progress:

7. Juliana Quant, M.S., since August 2009 (with D. J. Leopold).

MEMBER, STEERING COMMITTEE (other than those listed above)

1. Andrew Seifert (Ph.D., Syracuse University, M. Ritchie)
2. Patrick Raney (Ph.D., D. Leopold)
3. Yazmin Rivera (Ph.D., T. Horton)
4. Frances More (M.S., D. Leopold)

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

1. Adam Willis (Ph.D. candidacy exam, chair, Syracuse University)
2. Todd Ristau (Ph.D. defense, reader)
3. Evisa Abolina (Ph.D. candidacy exam, chair, FNRM)
4. Jess Riddle (M.S. defense, reader)

III. RESEARCH COMPLETED OR UNDERWAY

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

- Diversity-stability relationships of forest herbs over 40 years at Andrews Experimental Forest (1 %).
- Demonstration of Ecosystem Management Options (DEMO) study in the Pacific Northwest (5 %).
- Mechanisms of coexistence in the ancient cycad *Dioon sonorense*, Mexico (5 %).
- Restoration of early successional habitat for an endangered rattlesnake through prescribed burning (5 %).

- 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)
- USDA CSREES/McIntire-Stennis. Forest change in the Adirondacks over 40 years. \$25,563; 2011-12, (PI). (a new PhD student, Jay Ward Wason, III, will be supported starting in summer 2011)
 - National Park Service. Appalachian Trail MEGA-Transect Study. Total budget: \$747,242; 2010-13, (CoPI). (\$49,310 supports SUNY-ESF graduate student, J. Quant, and field vegetation studies by SUNY-ESF).
 - Northeastern States Research Cooperative. Impacts of acidic deposition and soil calcium depletion on terrestrial biodiversity and food webs. \$149,831; 2010–13, (CoPI).
 - USDA CSREES/McIntire-Stennis. Characterization of montane forests using remote sensing. \$79,453; 2010-12, (CoPI).
 - USDA CSREES/McIntire-Stennis. Coupling local-scale climate change and forest ecosystems. \$81,271; 2010-12, (Co-PI).
2. Research Proposals pending (include information as in B.1., above).
- Northeastern States Research Cooperative. Global change fingerprints in montane boreal forests: Implications for biodiversity and management of the northeastern protected areas. \$89,497; 2012-13, (PI).
 - Northeastern States Research Cooperative. Multi-sensor data assimilation to characterize ecosystem health of montane forests. \$135,949; 2011-13 (CoPI).
3. Research Proposals submitted, but rejected (include information as in B.1., above). – None.

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

- **Dovčiak, M.**, and Halpern, C.B. (2010). Positive diversity–stability relationships in forest herb populations during four decades of community assembly. *Ecology Letters*, 13, 1300–1309.
- Álvarez–Yépez, J.C., **Dovčiak, M.**, and Búrquez, A. (2011). Persistence of a rare ancient cycad: effects of environment and demography. *Biological Conservation*, 144, 122–130.
- Brown, J., and **Dovčiak, M.** (submitted). Transient and longer–term changes in microclimate and vegetation across forest edges created by clear–cutting. *Forest Ecology and Management*.
- Beier, C., Stella, J., **Dovčiak, M.**, and McNulty, S. (submitted). Local climatic drivers of changes in ice phenology and duration on high–elevation lakes in the Adirondack Mountains, New York. *Climatic Change*.
- Beier, C.M., Woods, A.M., Hotopp, K.P., Gibbs, J.P., Mitchell, M.J., **Dovčiak, M.**, Leopold, D.J., Lawrence, G.B., and Page B.D. (submitted). Soil calcium influences communities at multiple trophic levels in the northern hardwood forests of the Adirondack Mountains, NY. *Canadian Journal of Forest Research*.

B. Non-refereed Publications – None.

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

- Global Change and the World's Mountains, Perth, UK (Sept. 26-30, 2010). “Forest management changes microclimate and bryophyte diversity in the Cascade Mts. of western Washington”.
- Ecological Society of America, annual meeting, Pittsburgh, PA (Aug. 1-6, 2010).
 1. “Forest management changes microclimate and bryophyte communities in the Cascade Mts”.
 2. “Persistence of a rare ancient cycad: effects of environment and demography” (co-author; presented by A. Búrquez).
 3. “Plant community and microclimate changes across forest edges” (co-author; presented by J. Brown).
 4. “Variability in land snail, salamander and plant communities along gradients in soil calcium and acidic deposition in the Adirondack Mountains, New York” (co-author; presented by C. Beier).

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

- Invited Seminar, USDA Forest Service, Forest Sciences Laboratory and Alleghany National Forest, March 14, 2011, (~15 attendees).
- Invited Seminar, Utica College, Biology department, April 11, 2011, (~30 attendees).

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local): – None
2. Industrial and Commercial Groups, etc. – None

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

- Worked with the National Park Service (incl. Great Smokey Mts. NP, Shenandoah NP, and Delaware Water Gap) to document how acid deposition may have affected ecosystems along the Appalachian Trail.
- Worked with the New York State Department of Environmental Conservation to adapt prescribed fire as a management tool for restoring summer habitat of endangered eastern massasauga rattlesnake in Cicero Swamp Wildlife Management Area, New York.
- Worked with Shingle Shanty Preserve and Research Station in the Adirondacks, New York, to develop their ecological research, monitoring, and outreach program.
- Responded to various inquiries from the public (e.g., Pheasants Forever Inc., Syracuse Botanical Club).

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.) – None.

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

Mountain Research Initiative Expert Database (member)
 SUNY-ESF Beech Working Group (member)

2. Professional Society Membership

Ecological Society of America
Adirondack Research Consortium

3. Other Professional Activities

- a. Editorial activity – None.
- b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Biological Invasions	2
Ecological Research	2
Journal of Forest Research	1

<u>Agency</u>	<u>No. of proposals</u>
German Research Foundation (DFG)	1

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

- Hardy L. Shirley Faculty Mentoring Colloquium, Syracuse, NY, January 12, 2011.
- Upstate New York fens (Nelson Swamp Unique Area, Summit Lake), field trip, May 25, 2011

D. Foreign Travel (Where, When, Purpose)

- Global Change and the World's Mountains Conference, Perth, UK, Sept. 26-30, 2010: a contributed talk.
- Technical University in Zvolen, Slovakia, July 2010: Manuscript preparation on Norway spruce invasions into montane grasslands.

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

Chair, Committee for Robert Burgess Graduate Scholarship in Ecology
Graduate Program Advisory Committee (member)
Participating instructor in the preparation of the new co-taught EFB 210–*Diversity of Life I*
EFB greenhouse collections development with Terry Ettinger and others (ongoing)

B. College-level

Committee on Research (member)
Council for Geospatial Modeling and Analysis (member)
Center for Urban Environment (core faculty member)
Spotlight on Research Student Conference (co-organizer)
Learning Community Retreat for Incoming Freshmen (faculty leader)

C. University-wide, including Research Foundation– None.

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.

Students: In the Fall I taught EFB 535–*Flowering Plants: Diversity, Evolution, and Systematics* (formerly Systematic Botany). Students seemed to enjoy this upper level course with laboratory as suggested by their many positive comments, relatively high rating of 4.6 in the end-of-course surveys, and the increasing enrolment (advanced registration for Fall 2011 is ~100% greater than in previous years). Course details are on a public website (<http://www.esf.edu/efb/dovciak/EFB535.htm>). In the Spring I taught EFB 445/645–*Plant Ecology and Global Change* (formerly Plant Ecology) for the first time under the new course name and description. The enrolment significantly increased in EFB 645 (by ~50% relative to previous years; EFB 445 enrolment did not change). Course details are available on a public website (<http://www.esf.edu/efb/dovciak/EFB445-645.htm>). In addition to these courses, I gave guest lectures in EFB 326–*Diversity of Plants* (twice) and in Bio 415/615–*Conservation Biology* at Syracuse University. I advised 17 undergraduate students (incl. two NSF-UMEB research students) and 7 graduate students (incl. one who graduated with an MPS degree and one who passed doctoral candidacy exams). I served on steering or examination committees for another 8 graduate students (incl. two at Syracuse University), was a faculty leader for the orientation of our incoming freshmen to ESF during the Learning Community Retreat, and co-organized ESF Spotlight on Research showcasing undergraduate and graduate work. My advisees were successful on many fronts this year as suggested by these accomplishments: lead author on a paper published in well-regarded *Biological Conservation*, lead author on a NSRC grant, two Sussman and one PLACA awards, two Pack Institute awards, a 3rd place among undergraduate posters in ESF Spotlight on Research, a former graduate student hired at the well-regarded Jones Ecological Research Center in Georgia as the lead plant ecology technician, and two former research undergraduates continuing graduate studies at other universities (PhD-University of Miami, MS-SUNY Brockport).

Department/College: My main contributions to the departmental/college national/regional profile were my involvement as a CoPI in a large multi-agency NPS-funded Appalachian Trail Mega-Transect Acid Deposition Effects Study (<http://science.nature.nps.gov/im/units/appa/projects/aciddep/aciddeposition.cfm>), my collaboration with state agencies such as the New York State Department of Environmental Conservation (in habitat management for the endangered eastern massasauga rattlesnake in Cicero Swamp Wildlife Management Area), and my continued service as a reviewer for major international peer-reviewed journals (5 manuscripts, 3 journals) and funding agencies (German Research Foundation). I contributed within the College by serving on the Committee on Research, Council for Geospatial Modeling and Analysis, and by participating as a founding member in the Beech Working Group and a core faculty member in the Center for Urban Environment. At the departmental level I continued to serve as the Chair for the Selection Committee for the Burgess Graduate Scholarship in Ecology, member of the Graduate Program Advisory Committee, by participating as one of the instructors in the preparation of the new co-taught EFB 210–*Diversity of Life I*, and by developing EFB greenhouse collections with Terry Ettinger and other faculty members.

Professional Development: Professionally, this was a good year. I published two papers in high-impact journals, one in *Ecology Letters* (Impact Factor 10.3) as a lead author and one in *Biological Conservation* (Impact Factor 3.2) as a senior co-author with one of my graduate students. I co-authored three additional manuscripts that were submitted for peer-review, all based on research started at ESF since 2007. I gave two invited research seminars stemming from my work in the Pacific Northwest—at the Utica College and at the USDA Forest Service Forest Sciences Laboratory and Alleghany National Forest, PA. I presented my research also at the Annual Meeting of the Ecological Society of America in Pittsburgh and the Global Change and the World's Mountains Conference in Perth, Scotland, and traveled to Slovakia where I continue collaborative studies of Norway spruce invasions into montane meadows. I continued building my research group which now includes seven graduate students. I have successfully graduated my second masters' student, advanced to candidacy my first doctoral student, and recruited my second doctoral student. I continued as a CoPI on the NPS-funded Appalachian Trail MEGA-Transect Study, a NSRC grant on Calcium

importance for biodiversity, two McIntire-Stennis grants, and as a lead PI on another McIntire-Stennis grant. In addition, I have submitted two new grant proposals to NSRC (one as lead PI, one as a CoPI; both pending). Details about my research group, projects, publications, and teaching are on my lab website (<http://www.esf.edu/efb/dovciak>).

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)

My main plans and ambitions for the near future (next 16 months) are to (1) finalize and submit a significant number of manuscripts that I currently have in various stages of preparation (5-10, ranging from almost complete manuscripts to studies currently in data analysis stage to studies with ongoing data collection to ideas for short review/paradigm papers), (2) obtain more significant funding as a PI to support expansion of my current vegetation and global change studies on the Whiteface Mt. in the Adirondacks and along the Appalachian Trail MEGA-Transect, (3) stabilize the size of my research group with a greater proportion of PhD students and potentially a post-doctoral scientist, (4) co-organize a symposium or a workshop closely related to my current research at a significant national or international meeting, (5) develop and deliver lectures and a laboratory for the flowering plants portion of EFB 210–*Diversity of Life I*, (6) develop and teach a new seminar EFB 797–*Global Change Ecology*, (7) continue improving my main courses EFB 445/645–*Plant Ecology and Global Change*, and EFB 535–*Flowering Plants: Diversity, Evolution, and Systematics* (including the planned addition of new field trips to EFB 535), (8) teach a Plant Ecology/Taxonomy section of EFB 202–*Ecological Monitoring and Biodiversity Assessment* at the Cranberry Lake Biological Station, (9) continue contributing to other courses with guest lectures as appropriate (e.g., *Diversity of Plants* and *Conservation Biology* at Syracuse University), and (10) continue committee and public service as appropriate.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2011

a. Course(s) to be offered

EFB 202–*Ecological Monitoring and Biodiversity Assessment* (two 2–day field modules on Plant Ecology and Taxonomy in this co-taught 3 credit field course at the CLBS)

b. Proposed research activity

(i) Develop and submit NSF/NPS proposals on global change effects in montane forests

(ii) Collect photosynthesis data from an elevational gradient as a pilot data for (i) above.

(iii) Complete and submit several manuscripts currently in preparation:

- Dovčiak, M., Evans, S.A., and Halpern, C.B. Tree canopy removal causes different declines of forest bryophyte diversity and abundance in different microhabitats. *Ecological Applications*.
- Dovčiak, M., Ujházy K, Hrivnák R, and Gömöry D. Patterns of tree invasions into grasslands: insights from demographic and genetic spatial analyses. *Journal of Ecology*.
- Giencke, L., Dovčiak, M., Mountrakis, G., and Mitchell, M. Spatiotemporal dynamics of beech bark disease: fine–scale patterns, mechanisms and consequences of disease spread. *Ecological Applications*.
- Osborne, P.A., Dovčiak, M., Gibbs, J.P., and Patrick, D.A. Restoration of early successional habitat for threatened eastern massasauga rattlesnake by prescribed fire. *Restoration Ecology*.

c. University, professional society, and public service

Committee service as appropriate.

2. Fall Semester 2011

a. Course(s) to be offered

EFB 535–Flowering Plants: Diversity, Evolution, and Systematics (3 credits; 17 students registered)

EFB 797–Global Change Ecology (1 credit; 7 students registered)

EFB 210–Diversity of Life I (3 lectures & 1 lab in co-taught 3 credit course, 22 students registered)

b. Proposed research activity

(i) Develop NSF LTREB proposal to study diversity effects on long-term vegetation dynamics at H.J. Andrews Forest (Watersheds 1 and 3 studies) or Cedar Creek Ecosystem Science Reserve (oak savannah studies).

(ii) Propose a Symposium for ESA 2012 related to long-term forest dynamics or ecotone dynamics.

(iii) Complete and submit manuscripts currently in preparation or in development:

- Westerband, A., LaQuay, G., Medeiros, J., and Dovčiak, M. Topography influences plant–soil interactions in a semi–arid woodland ecosystem. *Journal of Vegetation Science*.
- Alvarez-Yepiz *et al.* Facilitation in *Dion sonorense*.
- Osborne *et al.* Seasonal diversity-stability relationships in old-field grassland communities.
- Dovčiak, M., Halpern, C.B. Long-term effects of the initial pre-disturbance diversity on community assembly/recovery.
- Dovčiak, M., Peterson, D.W., Reich, P.B. Diversity-stability relationships and plant community development at Cedar Creek Ecosystem Science Reserve.
- Dovčiak, M., *et al.* Review of plant migration patterns.

(iv) Supervise vegetation and related analyses within the Appalachian Trail Mega-transect study.

(v) Supervise the Adirondack research project funded by McIntire-Stennis grant.

c. University, Professional society, and public service

Continue current service in College-wide commitments–CGMA, CUE, and Beech Working Group, as well as departmental commitments such as chairing the Burgess Scholarship in Ecology and participating in Graduate Program Advisory Committee. Other service as appropriate.

3. Spring Semester 2012

a. Course(s) to be offered

EFB 445/645 Plant Ecology and Global Change (3 credits)

b. Proposed research activity

(i) Develop/submit revised research proposals as needed (e.g., NSRC, NSF, NPS)

(ii) Prepare field work for the Adirondack McIntire-Stennis Project

(iii) Complete and submit any manuscripts not completed in the summer/fall cycle above

(iv) Prepare manuscripts/follow-up proposals based on the Appalachian Trail Mega-transect study.

c. University, professional society, and public service

Continue current service in College-wide commitments—CGMA, CUE, and Beech Working Group, as well as departmental commitments such as chairing the Burgess Scholarship in Ecology and participating in Graduate Program Advisory Committee. Other service as appropriate.