

**ANNUAL REPORT: June 1, 2016 – May 31, 2017**  
**(i.e., Summer 2016, AY 2016-2017)**  
**DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY**  
**SUNY-ESF**

**NAME:** Martin Dovciak (on sabbatical in Fall 2016)

**I. INSTRUCTIONAL ACTIVITIES**

1. Regular Course Offerings

	<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>	<u>No. Sections</u>	<u>No. of Lab.</u>
FALL:	Sabbatical leave					
SPRING:	EFB 445	Plant Ecology & Global Change	3	40	-	3
	EFB 645					
	12	-				
	EFB 523	Tropical Ecology (co-taught)	3	11	-	

**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>
EFB 420	Prof. Internship/Env. Biol.	3	1
EFB 999	Doctoral Thesis Research	24	4

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

- Invited webinar for CEATI International Inc., Centre for Energy Advancement Through Technical Innovation Vegetation Management Task Force. “Human-based spread of invasive plants from powerline corridors in New York State” (audience from the electric utility industry from across the United States and Canada; September 20, 2016).
- Invited workshop lecture for New York Society of American Foresters, Annual Meeting—Forestry in the Changing World, Workshop D-Invasive Forest Plants. “Climate change and its relationship to invasive plants in forested landscapes” (audience from natural resource agencies, state and private forest owners and forestry professionals across NYS; Syracuse, NY, Jan. 27, 2017).

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
EFB 326	Plant Evolution, Diversification and Conservation	1

## II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor   21   and unofficial advisor   0
- 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

- Margaret Roberts, Ph.D. Student (since September 2015)
- Mariano Arias, Ph.D. Student (since September 2015)

### CO-MAJOR PROFESSOR

- Monica B. Berdugo Moreno, Ph.D. Candidate (Ph.D. student since August 2012; with R. Kimmerer)
- Michael Whalen, Ph.D. Student (since April 2015; with S. Farrell)

### MEMBER, STEERING COMMITTEE (other than those listed above)

Completed:

- Liza Iegorova (M.S., J. Gibbs)
- Ella Grey (M.S., FNRM, E. Bevilacqua)
- Kelley Corbine (M.S., FNRM, C. Nowak)

In Progress:

- Alex Petzke (Ph.D., D. Leopold)
- Kelsey Martinez (Ph.D., J. Fridley, Syracuse University)
- Sam Peterson (M.S., J. Frair)

### CHAIRMAN OR READER ON THESIS EXAMS, ETC.

- Aziz Demir (M.S. Defense, PBE, Chair)

## III. RESEARCH COMPLETED OR UNDERWAY

- A. Departmental Research (unsupported, boot-legged; title - % time spent) —None.
- 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)
- NYSERDA. "Effects of acidic deposition and soil acidification on forest understory plant biodiversity in the Adirondack Mountains". T. Sullivan (PI), M. Dovciak, G. Lawrence, T. McDonnell; \$200,000; 3/2015-10/2016. (\$87,001 to M. Dovciak; M. Whalen-supported PhD student, Matt Glaub & Tim Callahan-student field crew members).
  - NYS DEC. "Evaluating deer impacts on forests of New York State". M. Dovciak (PI), J. Frair, J. Hurst, P. Curtis, P. Smallidge. \$312,213. 4/2014-3/2017 (M. Lesser and, partially Rachel Wheat -supported post-doctoral associates; M. Roberts and J. Wason- partially supported PhD students).
2. Research Proposals pending (include information as in B.1., above)—None.
3. Research Proposals submitted, but rejected (include information as in B.1, above).
- NSF RAPID Program (Proposal prospectus submitted to NSF): Fire-vegetation-environment interactions across the complex gradients in Great Smoky Mountains National Park after 90 years of fire exclusion. Co-PI with Peter White and Julie Tuttle (declined).

## 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

\* graduate student advisee

(1) Published, In Press, or Accepted:

- Wason JW\*, Dovciak M. 2017. Tree demography suggests multiple directions and drivers for species range shifts in mountains of Northeastern United States. *Global Change Biology*, doi:10.1111/gcb.13584 (in press).
- Wason JW\*, Bevilacqua E, Dovciak M. 201x. Climates on the move: Implications of climate warming for species distributions in mountains of the northeastern United States. *Agricultural and Forest Meteorology* (accepted).
- Wason JW\*, Dovciak M, Beier CM, Battles JJ. 2017. Tree growth is more sensitive than species distributions to recent changes in climate and acidic deposition in the northeastern United States. *Journal of Applied Ecology*, doi:10.1111/1365-2664.12899 (in press).
- Jaloviar P, Saniga M, Kuchel S, Pittner J, Vencurik J, Dovciak M. 2017. Seven decades of change in a European old-growth forest following a stand-replacing wind disturbance: A long-term case study. *Forest Ecology and Management* 399:197-205. DOI: 10.1016/j.foreco.2017.05.036 (in press).
- Wiezik M, Gallay I, Wiezikova A, Ciliak M, Dovciak M. 2017. Spatial structure of traditional land organization allows long-term persistence of large *Formica exsecta* supercolony in actively managed agricultural landscape. *Journal of Insect Conservation*, DOI: 10.1007/s10841-017-9973-3 (in press).
- Alvarez-Yepiz JC\*, Burquez A, Martinez-Yrizar A, Teece M, Yopez EA, Dovciak M. 2017. Resource partitioning by evergreen and deciduous species in a tropical dry forest. *Oecologia* 183: 607-618 (published).
- Raney PA, Leopold DJ, Dovciak M, Beier C. 2016. Hydrologic position mediates sensitivity of tree growth to climate: Groundwater subsidies provide a thermal buffer effect in wetlands. *Forest Ecology and Management* 379, 70–80 (published).

(2) Submitted:

- Alvarez-Yepiz J\*, Burquez A, Martinez-Yrizar A, Dovciak M. Integrating research approaches for the conservation of the endangered cycad *Dioon sonorense*. *Oryx—The International Journal of Conservation* (submitted).
- Lawrence GB, McDonnell TC, Sullivan TS, Dovciak M, Bailey SW, Antidormi MR, Zarfos MR\*. Acidic deposition combines with beech bark disease to influence composition and structure of sugar maple-beech forests. *Ecosystems* (submitted).
- McDonnell T, Sullivan T, Reinds GJ, Clark C, Bonten L, Mol-Dijkstra J, Wamelink W, Dovciak M. Feasibility of coupled empirical and dynamic modeling to assess climate change and air pollution impacts on temperate forest vegetation of the eastern United States. *Environmental Pollution* (submitted).

B. Non-refereed Publications—None.

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

- Dovciak M<sup>‡</sup>, Wason J\*, Lesser M, Hurst J, Frair J. 2017. Climate and other drivers of forest understory plant richness and composition in the Adirondacks and New York State. Adirondack Research Forum, Old Forge, New York, March 1.
- Dovciak M<sup>‡</sup>, Wason J\*, Lesser M, Hurst J, Frair J. 2016. Warming climate may negatively affect native forest understory plant richness and composition by increasing invasions of non-native plants. American Geophysical Union Fall Meeting, San Francisco, CA, Dec. 12-16.
- Dovciak M<sup>‡</sup>, Wason J\*, Lesser M, Hurst J, Frair J. 2016. Ecological drivers of native and non-native forest plant species diversity and composition in New York State. Ecological Society of America, Annual Meeting, Ft. Lauderdale, FL, Aug. 7-12.

- Whalen M<sup>‡\*</sup>, Dovciak M, Lawrence G, McDonnell T, Sullivan T. 2017. Exploring legacy effects of acid deposition on northern hardwood understory plant community dynamics. Adirondack Research Forum, Old Forge, New York, March 1.
- Lawrence GB<sup>‡</sup>, Sullivan TJ, McDonnell TC, Bailey SW, Dovciak M, Antidormi MR. 2016. Influence of soil-base availability on composition and structure of Adirondack, NY, sugar maple-beech forests. Soil Science Society of America Annual Meeting, Phoenix, AZ, Nov. 6-9.
- Sullivan T<sup>‡</sup>, McDonnell T, Beier C, Belyazid S, Burns D, Clark C, Cosby B, Dovciak M, Driscoll C, Jackson W, Lawrence G, Reinds G, Sams C, Shao S, Whalen M\*. 2016. Ecosystem recovery from S and N deposition and associated critical loads in context of changing climate. NAPD Fall Meeting, Santa Fe, NM. Oct. 31- Nov. 4.
- Nowak C<sup>‡</sup>, Quant J, Dovciak M. 2016. Human-based spread of invasive plants from powerline corridors in New York State. Invited paper presented at the Annual Utility Arborist Association New York Fall Regional Meeting, Liverpool, NY. Oct. 13.

\* graduate student advisee; ‡ presenter

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

- (1) Invited webinar for CEATI International Inc., AND (2) Invited workshop lecture for New York Society of American Foresters, Annual Meeting. For details see I.3. Continuing Education and Extension (above).

## V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

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

- New York Power Authority. Contributing to the development of guidelines on the effectiveness of cleaning techniques for controlling transport of invasive exotic plants on power line rights-of-way in New York by vegetation management crews.
- New York State DEC, Cornell Cooperative Extension. Contributing to the development of public outreach and citizen science component of the project on the impacts of deer on forests of New York State.

2. Industrial and Commercial Groups, etc.—None.

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

- Provided an interview to P. Kitchen, Newsday.com on the effects of weather on pollen loads
- Shingle Shanty Preserve and Research Station, Adirondacks, NY. Vegetation monitoring (informal advisor).
- Regular interaction with the public/answering of inquiries on plant ecology, taxonomy, global change, and sustainability.

## VI. PROFESSIONAL DEVELOPMENT

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

- Included on the List of Researchers of Flora of Velka Fatra, western Carpathians (to be published by Blatnica Botanical Garden, Komenius University, Bratislava, Slovakia)

- Invited to join the Editorial board of *The Scientific Pages of Soil and Water Science*—a peer reviewed open access journal with publishing focus including biology and ecology of soils, surface waters and wetlands, and soil-plant relations, biogeochemistry, and bioremediation (declined).

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

- International Association for Vegetation Science (IAVS)- Editorial Board Member
- New York Climate Change Science Clearinghouse (NYCCSC)- Sector Expert: Agriculture and Forestry
- Mountain Research Initiative- Expert Database Member
- New York Invasive Species Research Institute- Expert Database Member

2. Professional Society Membership

- Ecological Society of America
- Botanical Society of America
- International Association for Vegetation Science
- Society of American Foresters
- American Geophysical Union

3. Other Professional Activities

a. Editorial activity

<u>Journal (s)</u>	<u>Responsibility</u>
• Journal of Vegetation Science	Editorial Board Member
• Applied Vegetation Science	Editorial Board Member

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
• Forest Ecology and Management	1
• Journal of Vegetation Science	2
• PLOS One	1

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
Responses of northern forest tree species to climate change and drought (webinar).	Feb. 22, 2017	Univ. New Hampshire

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

- Sabbatical leave to focus on the applications of large-scale ecological monitoring strategies and associated long-term databases used in plant biodiversity and forest conservation in the United States and in Europe: Summer and Fall Semester 2016, including a visit to Technical University in Zvolen, Slovakia, and conference participation reported elsewhere in the annual report.

D. Foreign Travel (Where, When, Purpose)

- Western Carpathians and Technical University in Zvolen, Slovakia (July/August, 2016). Collaborative Research: Long-term dynamics of old-growth forests; effects of changing land-use (2 papers in press). Old-growth dynamics work related to the sabbatical goals to study and use long-term databases of the national monitoring system of old-growth forests in western Carpathians, Slovakia.

## VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

### A. Department-level

- Conservation Biology Major representative, Spring Open House for accepted and prospective students.
- Search Committee for Instructional Support Specialist (Gen. Biology, Plant Sci., Microbiology, Genetics)
- Graduate Program Advisory Committee, member
- Scientist-in-Residence and Roosevelt Forest Ecologist, Roosevelt Wild Life Station

### B. College-level

- Regular meetings with visiting prospective graduate students and visiting scientists (I met one-on-one with all visiting candidates for both searches for a plan/tree physiologist both at ESF/FNRM and SU. Other examples include a meeting with Dr. Ortiz and W. Viggiano from the Galapagos Program of the IES).
- Graduate Program in Environmental Science–Ecosystem Restoration Program, member
- Graduate Program in Environmental Science–Environmental Monitoring and Modeling Program, member
- CSTEP program mentor
- Young Forest-Wildlife working group, member
- Beech Working Group, member
- Center for Urban Environment, member

### 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: I took a sabbatical leave in the Fall, so my teaching and interacting with students occurred only in the Spring Semester this year when I taught or co-taught two courses. I taught Plant Ecology and Global Change (EFB 445/645) to one of the largest enrollments in this class (52 students, including 12 graduate), and I co-taught Tropical Ecology (EFB 523) with Don Stewart (11 students, including 1 graduate). This was the first time I taught Tropical Ecology and a good challenge after my sabbatical (I spent a portion of my sabbatical preparing for teaching this course). Don Stewart and I took the Tropical Ecology class to Dominica in March where to explore tropical ecosystems and their management across dramatic elevational gradients, a topic closely related to my research agenda and likely to yield topics for honors or independent undergraduate student projects in the future. Judging by student comments, they enjoyed studying tropical ecology in the field setting very much. As a part of the course I developed two iNaturalist project pages on the flora and fauna that we encountered during the class to serve as a study resource for the students, and possibly for other naturalists visiting this Caribbean island (the class species lists were the second largest dataset on iNaturalist on Dominica as of April 30, 2017). In addition, I continued to work with my current PhD students on developing their thesis papers and proposals (Berdugo, Whalen, Roberts, Arias) and with recently graduated PD students who published several papers in solid journals over this past year (Wason—currently Yale Univ. postdoc, three papers in press; Alvarez-Yepiz, currently assist. prof. in Mexico, one paper in press, one in revision).

Department/College: Outside of my Fall sabbatical leave, I continued to represent College/Department in my broader professional service including (1) serving as an editorial board member in two flagship journals of the International Association for Vegetation Science (*Journal of Vegetation Science*, *Applied Vegetation Science*), and (2) serving as a PI or co-PI in larger collaborative research teams including several institutions and projects (i) NYSERDA project on acid deposition effects on plant diversity in the Adirondacks (supporting M. Whalen, M. Glaub, T. Callahan) and (ii) NYS DEC and Cornell Cooperative Extension project “Evaluating deer impacts on forests of New York State”. In addition, based on my recently completed NSRC project, I have been invited to provide (and I provided) metadata and publications into a broader regional database of NSRC funded projects as a part of a regional synthesis at the University of Vermont. In the Spring I enjoyed contributing to EFB Spring Open House as I represented Conservation Biology major and I started to contribute to a recently initiated EFB search for a new Instructional Support Specialist as a

member of the search committee. In addition, I continue to serve as a member of several faculty groupings (e.g., GPAC, the Ecosystem Restoration and Environmental Monitoring and Modeling GPES, and CSTEP).

Self/Professional Development: I took a sabbatical leave during the Fall semester to focus on bioinformatics, particularly on the applications of large-scale ecological monitoring strategies and long-term databases used in plant biodiversity and forest conservation in the United States and in Europe. In particular, I (i) worked with the FIA data to better understand how non-native plant invasions may be affected by changing climate, (ii) completed manuscripts based on the data from the large-scale climate-vegetation monitoring network that our lab established across northeastern United States, and (iii) visited Technical University in Zvolen, Slovakia as a part of a collaborative research on old-growth forest dynamics using a long-term (70-years) dataset from a country-wide database of long-term forest monitoring plots (broadly similar to the US FIA database). I co-authored six papers that are now in press or published, three additional papers that were submitted for peer-review, and four additional manuscripts that are in advanced stages of progress (two to be submitted this summer, two with me as a lead author). I am particularly pleased with the outcomes of my recently completed NSRC grant on the effects of changing environmental conditions (climate and acid deposition) on forests of northeastern United States that lead to three papers currently in press in top-tier journals (*Global Change Biology*, *Journal of Applied Ecology*, and *Agricultural and Forest Meteorology*). Other significant accomplishments this past year for me were two invited lectures— (i) a lecture on the effects of changing climate on invasions of non-native plants in NYS at a workshop of the NYSAF Annual Meeting, and (ii) a webinar on the spread of invasive plants in electric power line corridors for CEATI International Inc. Additionally, I gave three presentations on climate effects on non-native invasive distributions in NYS (at the ESA, AGU and ARF meetings) that generated interest (a good sign for the related manuscripts in preparation). Finally, co-teaching Tropical Ecology for the first time was a very inspiring and invigorating way of returning from a sabbatical leave—I developed a new set of lectures, study materials, and I learned a great deal about the ecology of the Caribbean Tropics—I am looking forward to teaching this class again next Spring as a more permanent addition to my teaching portfolio.

#### **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)**

During the next cycle I would like to accomplish the following main objectives (i) submit proposals and receive a substantial funding for a global environmental change research on forest ecosystems, particularly using the climate-vegetation monitoring network established by my lab across the northeastern United States (building on the current wave of papers in press in *Global Change Biology*, *Journal of Applied Ecology*, and *Agricultural and Forest Meteorology*)—this is the overarching priority since my other grants have been completed over the past two busy years; (ii) publish at least two first authored papers (a review and data paper) initiated during my sabbatical, both addressing aspects of climate and other environmental changes in forest ecosystems (also an important priority since over the past couple of years I have spent significant amount of time helping others publish their manuscripts), (iii) continuous support to my graduate program, with several of my current graduate students submitting their first papers to peer-reviewed journals; (iv) continuing to increase active and team-based learning aspects in my main classes (EFB 445/645 Plant Ecology & Global Change, and EFB 435/635 Flowering Plants: Diversity, Evolution, and Systematics); (v) continue to improve my lecture materials during my second time teaching EFB 523 Tropical Ecology, including developing course websites and expanding course iNaturalist pages to facilitate student learning and interest, and recruiting students (undergraduate honors, CSTEP, or graduate) to develop research projects that could be associated with this class and particularly the class field component in Dominica; and (vi) continue contributing to various continuing or new collaborative projects as appropriate.

#### **B. PROJECTED ACTIVITIES FOR NEXT YEAR**

##### 1. Summer 2017

##### a. Course(s) to be offered

- None in person, but two of my PhD students (Whalen, Roberts) are contributing to teaching plant ecology and taxonomy sections in EFB 202 at the Cranberry Lake Biological Station.

##### b. Proposed research activity

- Revise a grant proposal for resubmission to support the work on the vegetation-climate monitoring network established in our group across the northeastern United States.
- Finalize and submit at least two manuscripts based on the NYSERDA grant and FIA work, both on the effects of environmental changes (climate, deposition, deer) on plant communities.
- Support preparing final products (e.g., report, manuscripts) related to the Deer Impacts on Forests in NYS project and NYSERDA project.
- Support field and analytical work by my graduate students, including manuscript submissions.
- Contribute to developing the final manuscript for the ERPI study of the cleaning techniques impacts on plant invasions in New York power-line corridors.
- Travel to Technical University in Zvolen, Slovakia, to discuss current and future collaborations.

c. University, professional society, and public service

- I will continue to work on hiring a new EFB ISS to support teaching general biology, plant science/botany, microbiology, and genetics as a member of the search committee.
- Other Departmental/College/Public service as appropriate.
- Continuing to serve as an Editorial Board member for *Journal of Vegetation Science* and *Applied Vegetation Science*.

2. Fall Semester 2017

a. Course(s) to be offered

- EFB 435/635 *Flowering Plants: Diversity, Evolution, & Systematics*.
- Flowering plants sections in *Diversity of Life I* (EFB 210)

b. Proposed research activity

- Continue developing and revising interrelated proposals for several funding programs in the area of bioinformatics, plant/biodiversity conservation, and global change effects on forests in northeastern US forests for Fall and Spring competitions (e.g., NSF GSS, MacroSystems Biology, Coupled Natural and Human Systems, DEB Population & Community Ecology, Dimensions of Biodiversity, PIRE, USDA, or DoE).
- Finalize and submit two first-authored papers based on the FIA work and literature review (started during my semester-long sabbatical) to addresses the effects of environmental changes (climate, deposition, deer) on forest understory plant communities.
- Continue to work on current manuscript revisions/submissions (especially new manuscripts from NYSERDA-funded understory work, NYS DEC deer impacts project, and EPRI work).
- Support field and analytical work by my graduate students, including manuscript submissions.

c. University, Professional society, and public service

- Departmental/College/Public service as appropriate.
- Continuing to serve as an Editorial Board member for *Journal of Vegetation Science* and *Applied Vegetation Science*.

3. Spring Semester 2018

a. Course(s) to be offered

- EFB 445/645 *Plant Ecology & Global Change*
- EFB 523 *Tropical Ecology* (co-taught with D. Stewart)
- Guest lecture in *Diversity of Plants*, and potentially other guest lectures as appropriate.

b. Proposed research activity



- Continue developing and revising interrelated proposals for several funding programs in the area of bioinformatics, plant/biodiversity conservation, and global change effects on forests in northeastern US forests for Spring and Fall competitions (e.g., NSF GSS, MacroSystems Biology, Coupled Natural and Human Systems, DEB Population & Community Ecology, Dimensions of Biodiversity, PIRE, USDA, or DoE).
  - Completions/revisions of manuscripts initiated during summer and fall as appropriate.
- c. University, professional society, and public service
- Departmental/College/Public service as appropriate.
  - Continuing to serve as an Editorial Board member for *Journal of Vegetation Science* and *Applied Vegetation Science*.