

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

**\*\*\*PLEASE DO NOT INSERT TABLES FOR ANY CATEGORIES\*\*\***

NAME: Thomas R. Horton

**I. INSTRUCTIONAL ACTIVITIES**

1. Regular Course Offerings

	Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
SUMMER:					
FALL:	EFB 320	General Ecology	4	267	10
	EFB 428	Mycorrhizal Ecology	3	19	1
	EFB 628	Mycorrhizal Ecology	3	5	1

SPRING:

**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)

	Course No.	Title	Credit Hrs.	No. Students
	EFB 496	General Ecology Lab (no lecture)	1	4
	EFB 495	Undergraduate College Teaching	2	1
	EFB 498	Independent Research EFB	3	1
	EFB 628	Mycorrhizal Ecology	3	4
	EFB 899	Masters thesis research – Fall	2-3	2
	EFB 496	Ethnomycology	1	12
	EFB 899	Masters thesis research – Spring	1-2	2
	EFB 999	Honors thesis/Project	3	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 210	Diversity of Life I	3

## II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor   19   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

Barner, Jerome, MS, Finished August 2016,

Barner, Jerome Colin. 2016. Ectomycorrhizal fungi contribution to nutrient cycling of nitrogen, phosphorus, and calcium in northern hardwood forests. State University of New York College of Environmental Science and Forestry, ProQuest Dissertations Publishing, 2016. 10195377.

Patterson, Taylor, MS, Start August 2014

Hudon, Aimee, MS, Start August 2016

### CO-MAJOR PROFESSOR

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

Smith, Sara, MS, Kimmerer MP, Finished Fall 2016

Weber-Townsend, MS, Fernando MP, Finished Spring 2017

Brown, Aaron, MS, Parry MP, Finished Spring 2017

Anneberg, Thomas (SU), PhD, Segraves MP

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

Elniski, Autumn, MS, Siddarth Chatterjee MP, Finished Spring 2017, I served as chair.

## III. RESEARCH COMPLETED OR UNDERWAY

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

Verification of truffle mycorrhizae in a hazelnut plantation, Skaneateles NY. Last year we showed the truffle is doing well on the roots of the hazelnuts. This year I brought a truffle hound to search for truffle fruitbodies. None were found, but this was the 5<sup>th</sup> year since the plantation was installed and it is expected that at least 5 years are required until fruitbodies are produced. 1% time.

Effects of hemlock woolly adelgid on ectomycorrhizal fungi associated with *Tsuga canadensis* (eastern hemlock) in Central New York. The presences of wooly adelgid in hemlock stands led to a reduction in the number ectomycorrhizal root tips on the hemlock. Undergraduate honors thesis – Matthew Amoia. 1% time.

Verification that new transgenic American chestnut events from the Powell lab are readily colonized by mycorrhizal fungi. These data contribute to Powell's effort to obtain USDA approval for release of the transgenic lines into forest

systems. Undergraduate honors thesis – Hannah Roden. 1% time.

- 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)

Horton TR. USDA McIntire-Stennis Program. Increasing success of pitch pine restoration through soil microbe management. \$56,819. 8/15/16 – 9/30/19. Taylor Patterson, MS. Aimee Hudon, MS.

Yanai R, Horton TR. NSF. Collaborative Research: IDBR: Type A: The Nanaphid: A novel aphid-like nanosensor network for real-time measurements of carbohydrates in live plant tissue. National Science Foundation. \$59,816 for the ESF component, \$24,780 to Horton lab. Other institutions: SUNY Albany, SUNY College of Nanoscale Science and Engineering, Boston University. 2/1/15 – 1/31/17. Claudia Victoroff, MS.

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

NSF – Environmental Biology. Hobbie EA, Rowe R, Ouimette A, Horton TR. **Preliminary proposal:** Collaborative proposal: Mycorrhizal fungi, small mammals, and trees structure ecosystem functioning in a temperate forest.

**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

Horton TR (in press) Spore dispersal in ectomycorrhizal fungi at fine and regional scales. *In*: Tedersoo L, ed. Biogeography of mycorrhizal symbiosis. Dordrecht: Springer. ISBN: 9783319563626

B. Non-refereed Publications

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

1. Ectomycorrhizal Fungi from Resistant Spore Banks Support Post-Fire Pines. 4/23/2017. Northeast Natural History Conference. Cromwell Connecticut.

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

1. Mushrooms at the Albany Pine Bush Preserve – A Walk in the Woods. 9/18/2016. About 25 attendees.
2. Vince O’Neil Mushroom Festival. 10/9/2016. About 100 attendees through the day; 25 who joined the walk.
3. Quoted in an article by Marc Heller (online:Greenwire March 9, 2017) on the controversy over whether dead wood helps or hinders the spread of wildfires  
<http://www.eenews.net/greenwire/2017/03/09/stories/1060051219>.
4. The Fungus Among Us – A Cazenovia Preservation Foundation walk. 4/29/2017. About 20 attendees.

**V. PUBLIC SERVICE**

A. Funded Service (include consulting activities)

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

Project at the Albany Pine Bush Preserve to help with pine restoration effort.

2. Industrial and Commercial Groups, etc.

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

Scientific advisor – Central New York Mycological Society  
Scientific advisory board – Mianus River Gorge Preserve

**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)

Student Awards Committee, Mycological Society of America. 2013-2017. Chair 2017

2. Professional Society Membership

Mycological Society of America  
International Mycorrhiza Society

3. Other Professional Activities

a. Editorial activity

<u>Journal (s)</u>	<u>Responsibility</u>
Mycorrhiza	Editorial Board
<u>Other (books, symposia, etc.)</u>	

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Fungal Ecology	2
Mycorrhiza	2
New Phytologist	1
Journal of Forestry Research	1
<u>Agency</u>	
NSF	1
<u>Other</u>	

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
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Co-organized (with Dr. Jonathon Leake) a symposium on Mycorrhizal Networks for the 9<sup>th</sup> International Conference on Mycorrhiza, Prague, Czech Republic. July 30 – August 4, 2017.

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

This past spring I sat in on a graduate seminar at SU on Mutualisms led by Mark Ritchie and Kari Segraves. Mark led many of the discussions from his modeling perspective. Seeing someone tweak the Lotka-Volterra models to incorporate mutualistic interactions was great.

Over the past year I took the opportunity to meet with a series of researchers who came to the ESF and SU campuses. These were invited speakers for departmental seminars and jobs. This is an amazing group of well-respected scientists in my field or closely related fields -- I found their talks and our conversations very stimulating.

David Eissenstat – Pennsylvania State University

Mark Ritchie – SU

Nancy Johnson – Northern Arizona University

John Battles – UC Berkeley

Rich Phillips – Indiana University

This spring I began working with Karen Gentile at Upstate Medical University SUNYMAC (Molecular Analysis Core) to learn how to use the Illumina MiSeq platform. This is a cutting edge technology that will allow me to characterize fungal communities from hundreds of environmental samples in single runs. As of May 30, 2017 the results look promising.

D. Foreign Travel (Where, When, Purpose)

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

A. Department-level

Promotion and Tenure Committee

Manage plant growth chambers in Illick Hall 308

Participated in the Toxicology search

Lowe-Wilcox/Zabel/Morrell student awards committee, chair

I put together a large dataset of General Ecology student grades for the 2016-2017 assessment

B. College-level

Participated in searches for Plant Physiology positions at FNRM and SU Biology. I include the SU Biology search because of the importance of Plant Physiology to the botanical research and student training in EFB.

C. University-wide, including Research Foundation

**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:** The students in EFB 320, General Ecology, are my connection the select students of ESF. This year I had over 250 students in the class! With enrollment like that, I get to see some amazing students who clearly on their way to big things. The General Ecology lecture room is a very stimulating environment for me and I try my best to engage the class in discussions so that I may learn from everyone. I admit my ability to recognize the faces is far better than recall

of names, but it is great to see those students move through their coursework at ESF and wonderful to see so many win awards and head to be big things after graduation. A highlight this year was the gift of a drawing from a couple of my 'front-rowers' (anonymous, but I found out!). Across the top reads, "Beware the", and below that shows a couple of trees with some mushrooms with their roots and hyphae as a tangle of interactions that reads, "Tom Foolery". They then signed it, "your large charismatic, Megastudents". There is a lot going on in this gift and I'm happy to explain it to anyone who asks! But here I respond with a heartfelt THANK YOU to these very creative students... YOU GOT IT! This year I also taught my Mycorrhizal Ecology course. This is a small advanced course (19undergrads/4grads) and it was great to have students return from both General Ecology and last spring's Basidiomycetes course. This group excelled in all things Mycorrhizal Ecology. I gave a series of guest lectures in EFB 210, Diversity. One of these was a one-off on Ethnomycology...or so I thought. It was a big hit and the students asked me to teach a course on the topic in the spring. Done. I offered Ethnomycology as a reading seminar (EFB 496) and had to cap enrollment to facilitate open discussions (sorry to those that did not get in). It was great course in which we explored many interesting interactions between humans and fungi. I think I will run this one again! I also had a great group of students working in my lab on various undergraduate projects including two honor's projects. Both of the honor's projects lay foundations for additional work, one on the mycorrhizal condition of transgenic chestnuts and the other on the impact of hemlock woolly adelgid infection on hemlock mycorrhizal fungi. I also want to give a shout out to my workstudy student this year who did such a great job maintaining the lab at a high functioning level...Thank You! Finally, congratulations to all of the students that are headed to great jobs and graduate programs!

#### **Department/College:**

I taught General Ecology to many students from the EFB majors and other departments. I served on the EFB Promotion and Tenure committee. We were busy with several faculty up for their 3-year review and others up for promotion to associate professor with continuing appointment. This job of reviewing the work of early career colleagues is a critical service to the candidates, the department and the college. The department is in a great phase right now with productive colleagues at all levels. I also attended job seminars for the Plant Physiology position in FNRM and another position for a Plant Physiologist in Biology at SU, and a position for a Toxicologist in EFB. All of these job searches were successful and I am happy to see such excellent new colleagues coming.

**Self Professionally:** This one is easy. This fall I put a considerable amount of time and energy into preparing my dossier for promotion to Full Professor. I have been recommended for the promotion by the departmental and college P&T committees, EFB chair, ESF Provost, and ESF President. There are a couple more reviews ahead, but it looks like I will officially be a full professor effective September 1. That is a big milestone on par with getting promoted to associate professor with continuing appointment (tenure). Not one to be comfortable losing momentum, I've also embarked on a new research direction involving deep sequencing. The technique is cutting edge and will open up many opportunities for new projects. Throughout my career I have found it very satisfying and productive to push my limits in terms of my comfort zone...always a bit challenging, but always well worth the effort. Deep sequencing is the next new thing for me, allowing a more thorough characterization of soil microbial communities (read: mycorrhizal fungi communities) and their responses to various treatments.

#### **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 2017

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

None

### b. Proposed research activity

- I am learning the Illumina MiSeq approach at the Molecular Analysis Core lab with Karen Gentile. This is for analyzing microbial communities from soils that received nutrient additions at Bartlett forest in collaboration with Ruth Yanai. In addition to learning this new technique so that I can better guide my students, the plan is to use these first data for a paper and as preliminary data for an NSF proposal.
- Analyze the data from the MiSeq run in preparation for a proposal and paper.
- Guide current graduate as they work on their projects in my lab and/or write their theses/pubs.
- Turn past Graduate student's thesis chapters into submitted manuscripts.

### c. University, professional society, and public service

EFB P&T Committee

ARB – EFB representative

Mycorrhiza Editorial Board

Chair Mycological Society of America Student Awards Committee

Attend 2017 MSA Annual meeting as chair of the student awards committee

Ad hoc reviewer for various journals and funding agencies

## 2. Fall Semester 2017

I will be on sabbatical leave.

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

### b. Proposed research activity

- Welcome incoming graduate student into my lab group.
- Analyze the data from the MiSeq run in preparation for a proposal and paper.
- Help current graduate and honors students with their research projects and/or write their thesis and publications.
- Write NSF preliminary proposal seeking funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.
- Guide current graduate and honors students as they work on their projects in my lab and/or write their theses/pubs.
- Turn past Graduate student's thesis chapters into submitted manuscripts.

### c. University, Professional society, and public service

Mycorrhiza Editorial Board

Ad hoc reviewer for various journals and funding agencies

## 3. Spring Semester 2018

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

EFB 298 Research Internship

EFB 496 ?Undergraduate Seminar: Topic to be determined?

EFB 498 Independent Research

EFB 899 Masters Experience

ESF 499 Honors Thesis

EFB 797 ?Graduate Seminar: Topic to be determined?

b. Proposed research activity

- Help current graduate and honors students with their research projects and/or write their thesis and publications.
- Write NSF preliminary proposal seeking funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.
- Guide current graduate and honors students as they work on their projects in my lab and/or write their theses/pubs.

c. University, professional society, and public service

- EFB P&T Committee ARB – EFB representative
- Mycorrhiza Editorial Board Awards committee – Mycological Society of America
- Ad hoc reviewer for various journals and funding agencies