

ANNUAL REPORT: June 1, 2015 – May 31, 2016
(i.e., Summer 2015, AY 2015-2016)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

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

NAME: Tom 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	230	10

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 420 (F)		Prof Internship/EFB	3-5	2
EFB 496 (F)		Advanced Mycology:Basidiomycetes	3	6
EFB 498 (F)		Independent Research/EFB	3-5	2
ESF 499 (F)		Honors Thesis/Project	1	1
BTC 298 (S)		Research Apprenticeship/Biotech	1	2
EFB 420 (S)		Prof Internship/EFB	3	1
EFB 496 (S)		Study Abroad	12	1
EFB 496 (S)		Fire Ecology	1	24
EFB 899 (S)		Masters Thesis Research	1-8	3
ESF 499 (S)		Honors Thesis/Project	1-3	3

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>
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II. STUDENT ADVISING

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

Jerome Barner, MS, January 2016 (transfer from FNRM, Yanai)
Taylor Patterson, MS, August 2015

CO-MAJOR PROFESSOR

Andrew Tomes 08/2013 (Robin Kimmerer Co-MP)
Brandon Haynes (Douglas Daley Co-MP) Finished July 2015

MEMBER, STEERING COMMITTEE (other than those listed above)

Arrigoni, Jim , PhD (Gibbs)
Dowie, Nicholas, PhD (Miller) University of Wyoming
Oakes, Allison, PhD (Maynard) Finished December 2015
Brown, Aaron (Parry)
Diggs, Franklin, MS (Yanai)
Smith, Sara, MS, (Kimmerer)
Weber, Joshua, MS (Fernando)
Funmi, Afeluma, MS (Lee Newman) Finished July 2015
Gray, Amanda, MS (Briggs) Finished July 2015
Bader, Grete, MS (Leopold) Finished May 2016
Schoenberg, Marie, MS (Daley) Finished May 2016

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Stagnitta, Timothy, MS (Kroll)

III. RESEARCH COMPLETED OR UNDERWAY

- A. Departmental Research (unsupported, boot-legged; title - % time spent)
- Verification of truffle mycorrhizae in a hazelnut plantation, Skaneateles NY. Unsupported. 1% time. Undergraduate project – Alexander Romer.
- Use of a soil bioassay technique as bait for locally adapted ectomycorrhizal fungi for oak establishment at the Albany Pine Bush Preserve. – 1%. Undergraduate Honors thesis – Stephen Garney.
- Verification of mycorrhizal colonization of new transgenic American chestnut events. 1% time. Undergraduate Honors thesis – Jalina Pannafino.
- Evaluating the Potential of Mycorrhizae for Increasing Chestnut (*Castanea dentata* [Marsh.] Borkh.) Restoration Success – 5%. Andrew Tomes MS student.
- Sporocarp production in forest stands following control burns in Menominee, WI – 1%. Sara Smith MS student.

- 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 (starts 8/2016).

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. Other institutions: SUNY Albany, SUNY College of Nanoscale Science and Engineering, Boston University. 2/1/15 – 1/31/17. Student to be determined when the funding is available.

Yanai R, Horton TR. USDA McIntire-Stennis Program. The Role of Mycorrhizae in Water Use in Northern Hardwood: Is Transpiration Optimized for Uptake Limiting Nutrients. \$55,229 8/15/15 – 9/30/17. Jerome Barner, MS.

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

DOE - Vadeboncoeur M, Horton TR, Yanai RD, Green M. Mycorrhizae and Soil Nutrient Interactions Control Plant Water Use and Carbon Gain. \$211,540. 6/1/16 – 5/31/19. (decision expected June 2016 or later)

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

NSF – Environmental Biology, 2016 Preliminary Proposal: Collaborative Research: Mammalian Fungivory Provides New Insights into Organic Nitrogen Dynamics in Terrestrial Ecosystems

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

Meyer RT, Weir A, Horton TR (2015) Small-mammal consumption of hypogeous fungi in the central Adirondacks of New York. *Northeastern Naturalist* 22:648-651.

Montoya L, Bandala VM, Baroni TJ, Horton TR (2015) A new species of *Laccaria* in montane cloud forest from eastern Mexico. *Mycoscience*: 56: 597-605.

Hayward J, Horton TR, Nuñez M (2015) Ectomycorrhizal communities coinvasion with Pinaceae species in Argentina: Gringos bajo el bosque. *New Phytologist* 208: 497-506.

B. Non-refereed Publications

Molina R, Horton TR 2015. Mycorrhiza specificity: its role in the development and function of common mycelial networks. In: Horton TR ed. *Mycorrhizal Networks*. Dordrecht: Springer.

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

Barner JC, Horton TR, Yanai RD. Belowground carbon allocation to ectomycorrhizal fungi associated with *Fagus grandifolia* in response to N, P, and Ca additions in northern hardwood forests. 8th ICOM, August 3-8, 2015. Poster.

Horton TR, Nuñez MA, Ashiglar A, Lewandowski TE, Hayward J DP, Swaney DP, Sørensen MKN. Spore dispersal in ectomycorrhizal Basidiomycota with implications for the invasive success of suilloids fungi. 8th ICOM, August 3-8, 2015. Poster.

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

Horton TR. Using fungi of the pine bush to promote pine restoration. Science Lecture Series: Albany Pine Bush Preserve. 9/17/2015. Approximately 40 attendees.

Horton TR. Vince O'Neil Mushroom Festival at Beaver Lake Nature Center with Central New York Mycological Society and Mid-York Mycological Society. 9/20/2015. 100+ (mushroom walk had about 20)

Horton TR. *Epipactis helleborine*: An invasive orchid that is probably in your garden. Master Gardener Business Meeting. Syracuse. 2/16/2016. Approximately 30 attendees.

Horton TR. Interviewed by Andrew Donovan at WSYR News Channel 9 at the site of a large fire in Kirkville, NY. The fire started on Friday May 20 and the interview occurred on Tuesday, May 24. The piece opened the 11:00 pm news on Tuesday night and reran at least once later that week. The focus of the piece was on issues around fire ecology, including how the plant and animal community would recover. It was posted on the ESF Facebook site and had 124 likes and 37 shares. Total audience is unknown, but the number of acquaintances who told me they saw the piece on the news suggests a decent viewership.

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.

2. Professional Society Membership

Mycological Society of America

International Mycorrhiza Society

Botanical Society of America

3. Other Professional Activities

a. Editorial activity

Mycorrhiza

Journal (s)

Responsibility
Editorial Board

Other (books, symposia, etc.)

Horton TR (Ed.) (2015) Mycorrhizal Networks: Ecological Studies Vol. 244, Springer. ISBN 978-94-017-7395.

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
New Phytologist	1
Ecological Letters	1
Mycologia	1
Biological Invasions	1
Mycorrhiza	2

<u>Agency</u>	<u>No. of proposals</u>
NSF	3
USDA Forest Service	2

Other

Review of chapter for new book on applied use of mycorrhizal fungi 1

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
Co-organized symposium on Mycorrhizal Networks –ICOM8	Aug 3- 8 2015	Flagstaff, AZ

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

D. Foreign Travel (Where, When, Purpose)

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

Promotion and Tenure Committee

Faculty mentoring committees: Gordon Paterson

Manage plant growth chambers in Illick Hall 308

Attended search talks for Disease Ecologist/Epidemiologist position (Brian Leydet hire)

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

B. College-level

Academic Research Building committee

Strategic Planning and campus-wide work environment issues

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

Each year the students in EFB 320, General Ecology, energize me and this year was no different. As usual, the students in the front rows, middle of the hall have the greatest impact. I really enjoy those times when an open discussion develops on a topic. I know I learn a great deal from you guys during these discussions and I hope everyone benefits. This year I received an anonymous letter from one of my EFB 320 students thanking me for being able to admit when I do not know and taking the time out of lectures to discuss the options openly – this is in my opinion the essence of an effective learning environment. That letter made my day, week, and year...thank you anonymous letter writer! To be sure, General Ecology is a foundation for most majors in EFB. I hope it is also a foundation for my student's careers and interests in natural history after finishing their studies at EFB. This year I also taught my advance course, Advanced Mycology: Basidiomycetes. The number of students that took the course was small, at only 6 undergraduates. These students were very appreciative that I taught the course despite the low enrollment and they were wonderful! They thrived with this more intimate learning environment, digging into the subject with my guidance rather than my direct instruction. I also taught a number of special courses in which students worked in my lab on individual projects. These students gain a wonderful view into the research endeavor as it may occur in a laboratory program such as my own that involves both field sampling and molecular techniques. Some are just dipping their toes in (EFB 298) while others are jumping in feet first (EFB 498, ESF 499). One of my EFB 498 students from the previous year had his paper published this year (Meyer et al. 2015). Another former student (our only undergraduate Fulbright Scholar) is now headed for a Ph.D. with a colleague at Stanford University. Again, I could not be happier for him!

Department/College

Teaching EFB 320, General Ecology always pops into my mind first when I think about service to the department and college. In addition to the students in the EFB majors, I taught many students from other departments (71 out of 230 total enrolled). I also served on the EFB Promotion and Tenure committee. We had several faculty up for their 3-year review and in addition to reviewing their current dossier, this also involved observations in the classroom. I am also one of the Departmental ARB committee members. After many year of work, the ARB is finally in the final stages of planning and I am very much looking forward to the facility. I was also on the Strategic Planning committee. Finally, there was lots of under the radar work on generating and supporting a more positive campus environment, an effort that has resulted in positive steps forward.

Self

My biggest personal success this year was the publishing of a book I edited with Springer's Ecological Studies series, Horton TR. 2015. *Mycorrhizal Networks*. Dordrecht, Netherlands: Springer. This is the 244th volume of a prestigious series with authors and editors that I consider leaders in their fields. I have found one review that ended with the following: "... the editor, authors and publishing staff did an excellent job on the content, style, and format of this book. Overall, I can recommend this book as a reference source for scientists already involved in mycorrhizal research, and as a scoping source for scientists from other disciplines looking for a manageable and well-studied example of a symbiotic system." My other big personal success was landing a McIntire-Stennis grant to conduct a research project at the Albany Pine Bush Preserve. The project combines my interests in the role of mycorrhizal fungi in plant succession and fire ecology. I always get great satisfaction advising high quality undergraduate students in my lab on small research projects and see those efforts contribute to their Honors Awards and landing jobs and graduate school positions. This year I taught an undergraduate seminar in Fire Ecology on the request of several General Ecology students. It filled up on the second day of registration with a great group and it is clear I will revisit the topic in a future course. During the semester I sent job announcements in fire ecology to the class and was recently told by a graduating seniors that she landed one of the jobs, which obviously made my day. The course also played role in my being interviewed with WSYR Channel 9 news about a fire that burned in Kirkville in May. In addition to editing the

Mycorrhizal Ecology book I authored the preface and co-authoring one chapter, I had three new articles published this year, including one in the New Phytologist (IF=7.6). Overall my papers continue to be frequently cited (h-index = 19), averaging about 60 citations/publication and 175 citations/year since 2005 (Web of Science 6/1/2016).

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 2016

a. Course(s) to be offered

b. Proposed research activity

Guide current graduate and honors students as they work on their projects in my lab and/or write their theses/pubs. NextGen sequencing experiments as proof of concept for future funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.

Write review chapter on spore dispersal in ectomycorrhizal fungi for a Springer Ecological Studies volume on Biogeography of Ectomycorrhizal fungi.

Write NSF/NSRC preliminary proposal seeking funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.

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

2. Fall Semester 2016

a. Course(s) to be offered

EFB 320 General Ecology

EFB 428/628 Mycorrhizal Ecology

EFB 298 Research Internship

EFB 498 Independent Research

EFB 899 Masters Experience

ESF 499 Honors Thesis

b. Proposed research activity

Welcome incoming graduate students.

Analyze data from NextGen sequencing run and use some as preliminary data for an NSF preliminary proposal seeking funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.

Help current graduate and honors students with their research projects and/or write their thesis and publications.
Finish and submit review chapter on spore dispersal in ectomycorrhizal fungi for a Springer Ecological Studies volume on Biogeography of Ectomycorrhizal fungi.
Write NSF/NSRC preliminary proposal seeking funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.

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

3. Spring Semester 2017

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
EFBESF 499 Honors Thesis
EFB 797 Graduate Seminar: Topic to be determined

b. Proposed research activity

Guide graduate and honors students with their research projects and/or write their thesis and publications.
Submit NSF/NSRC preliminary proposal seeking funding to evaluate ectomycorrhizal fungal responses under nutrient addition experiments.

c. University, professional society, and public service

Seek membership on the University Committee on Research
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