

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

**NAME:** Thomas R Horton

**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>
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SUMMER:

FALL:

EFB 320	General Ecology	4	278	10
EFB 428	Mycorrhizal Ecology	3	16	1
EFB 628	Mycorrhizal Ecology	3	6	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. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

Course No.	Title	Credit Hrs	No. Students
Spring 2011			
EFB 496	Con Bio in Ecuador	1-2	6

The students went to a small village in Ecuador and helped families understand and apply sustainable agricultural practices. The trip was during winter break. During the spring semester we met on a weekly basis and discussed issues involved in such endeavors. A big thanks goes to Whitney Lash who essentially ran the spring course. It was clear that the students gained a great appreciation of the constraints their families faced as they tried to 1) live sustainably off the land while simultaneously 2) work towards a higher standard of living exemplified by the students. Many discussion centered on the ecology and economics of energy extraction from petroleum to sugar cane.

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	EFB 420	Internship/EFB	3	4
	EFB 498	Res Prob/EFB	1-3	4
	EFB 798	Res Prob/EFB	6	1
	EFB 899	Masters Thesis	2	1
	EFB 999	PhD Thesis	2-12	2

Spring	BTC 498	Res Prob/Biotech	3	1
	EFB 420	Internship/EFB	3	1
	EFB 498	Res Prob/EFB	2-3	4
	EFB 797	Adv in Plant/Fungus Interactions	1	3
	EFB 798	Res Prob/EFB	2	1
	EFB 898	Professional Experience	2	1
	EFB 899	Masters Thesis	2	1
	EFB 999	PhD Thesis	8-12	2

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

Barcoding the diversity of Cusuco cloud forest – with Operation Wallacea. Seven 1 week sessions with an average of 5 students in each. Additional dissertation students learn the techniques and use the lab for their work.

4. Guest Lecture Activities

Course No.	Title	No. of Lectures
EFB 311	Principles of Evolution	1
FOR 332	Forest Ecology	1
EFB 445	Plant Ecology and Global Change	1

**II. STUDENT ADVISING**

A. Number of undergraduates for whom you are the student's official advisor 15 and unofficial advisor 3

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

Hayward, Jeremy, PhD, August 2010  
 Holmes, Elisabeth, MPS, January 2011  
 Orlousky, Marian, MPS, August 2009  
 Rivera, Yazmin, PhD, August 2007  
 Sakowski, April, MPS, August 2011  
 Tourtellot, Samuel, MS, August 2009  
 Vineis, Joseph, MS, May 2008

CO-MAJOR PROFESSOR

MEMBER, STEERING COMMITTEE (other than those listed above)

Bae, Kikang, PhD, Yanai  
 Contosta, Alix, PhD, Frey, University of New Hampshire, Defended Spring 2011  
 Crane, Sharron, PhD, Dighton, Rutgers University, Defended Fall 2010  
 D'Amico, Katherine, MS, Powell  
 Oakes, Allison, MS, Maynard  
 Dowie, Nick, PhD, Miller, University of Wyoming  
 Moebius-Clune, PhD, Pawlowska, Cornell University  
 Quinn, Christina, PhD, Fernando  
 Hornbeck, MS, Leopold

## CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Lu, Zhenyu, PhD, Im, ERE

### **III. RESEARCH COMPLETED OR UNDERWAY**

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

Mycorrhizal ecology of *Epipactis helleborine* – 1%

#### 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)

Yanai R, Horton TR, 8/21/2011 – 9/30/2013. Sustainable nutrient supply after forest harvest: Characterizing the fungal link from soils to roots. USDA-CREES/McIntire Stennis program. \$54,105.

Simberloff D, Nuñez MA, Horton TR. 2010 – 2013. Collaborative Research: Determinants of ectomycorrhizal fungal spread and its relation to Pinaceae invasion. NSF Population and Community Ecology panel. Total award = \$571,637; Total award to ESF = \$242,040; \$75,000 2009/10, \$83,226 2010/2011. Jeremy Hayward (PhD).

Powell WA, Maynard CA, Leopold DP, Horton TR, Perry D. 2008 – 2011. Evaluating environmental impacts of transgenic American chestnut trees to chestnut trees produced by conventional breeding. USDA – NRI, BRAG program. \$380,00. Sam Tourtellot (MS).

Hobbie E, Ollinger S, Varner, R, Frey S, Horton TR. 2006 – 2009 w/ No-cost extension to August 2010. Collaborative Research: Relationship between carbon allocation to mycorrhizal fungi and organic nitrogen use in temperate forests. NSF – Ecosystems panel. Total award = \$775,00, with \$188,127 to Horton. Supplemental funding awarded July 2009 for \$13,090 through August 2010. Joe Vineis (MS). This project has terminated and is now spent out.

Horton TR, 2006 – 2010. Fungal Biodiversity and Community Dynamics in the Oregon Coastal Dune Ecosystem. USDA-Forest Service, \$30,000. Tara Galante (MS). This project has terminated and is now spent out.

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

Galante TE, Horton TR, Swaney D (in press) 95% of basidiospores fall within one meter of the cap- a field and modeling based study. *Mycologia*.

Karpati AS, Handel SN, Dighton J, Horton TR (online) *Quercus rubra*-associated ectomycorrhizal fungal communities of disturbed urban sites and mature forests. *Mycorrhiza*. DOI 10.1007/s00572-011-0362-6.

Molina R, Horton TR, Trappe JM, Marcot BG (2011) Addressing uncertainty: How to conserve and manage rare or little known fungi. *Fungal Ecology* 4: 134-146.

Lilleskov EA, Hobbie EA, Horton TR (2011) Conservation of ectomycorrhizal fungi: exploring the linkages between functional and taxonomic responses to anthropogenic N deposition. *Fungal Ecology* 4: 174-183.

O'Brien MJ, Gomola CE, Horton TR (2011) The effect of forest soil and community composition on ectomycorrhizal colonization and seedling growth. *Plant Soil* 341: 321-331.

## B. Non-refereed Publications

Briggs RD, Horton TR (2011) Out of sight, underground: forest health, edaphic factors, and mycorrhizae. *In: Forest Health*. Castello J, Teale S. Eds. Cambridge University Press.

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

Vineis, J, Horton, TR, Hobbie EA. Ectomycorrhizal exploration along a nitrogen gradient. Joint meeting of the International Symposium of Fungal Endophytes of Grasses and the Mycological Society of America. Lexington Kentucky, June 28 - July 1, 2010.

Simberloff D, Nuñez M, Andrea M, Horton T, Barrios N. Impacts and management of a complex multi-species invasion. Joint Meeting of the 2nd Kentucky Invasive Species Conference and the 13th Annual Southeast Exotic Pest Plant Council Conference. May 2011. Keynote presentation.

Contosta AR, Frey SD, Knorr MA, Ollinger SV, Cooper AB, Horton TR. Seasonal, Biogeochemical, and Microbial Response of Soils to Simultaneous Warming and Nitrogen Additions. Harvard Forest Annual Symposium, March 2011.

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

- Yellow Parasols in House Plant Soil. Garden Journeys Segment with Terry Ettinger, Plays on YNN Channel 9. Recorded Fall 2010.
- Birds Nest Fungi Garden Journeys Segment with Terry Ettinger, Plays on YNN Channel 9. Recorded Fall 2010.
- Slime molds. Garden Journeys Segment with Terry Ettinger, Plays on YNN Channel 9. Recorded Fall 2010.
- Morels. Garden Journeys Segment with Terry Ettinger, Plays on YNN Channel 9. Recorded Spring 2011.
- The Common Indoor Mushroom - *Peziza domiciliana*. Garden Journeys Segment with Terry Ettinger, Plays on YNN Channel 9. Recorded Fall 2010.
- A weedy orchid - *Epipactis helleborine*. Garden Journeys Segment with Terry Ettinger, Plays on YNN Channel 9. Recorded Spring 2011.
- Edible fungi. Center of Excellence Skillshare event, Saturday, April 16, ~15 attendees.
- Numerous mushroom forays and meetings with the Central New York Mycological Society, ave 10/event.
- Mushroom fair, Beaver Lake Nature Center, September 19, 2010, ~100 attendees.

## 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.

Faculty representative for ESF's Student club, "Central New York Society for Conservation Biology".

## 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)

Chair - Program Committee, Mycological Society of America (2009-2010), This is a major responsibility as I organized the program for the July 2010 meeting in Kentucky and wrote the program. We had about 350 attendees.

Counselor – Ecology and Pathology (elected position, August 2009 – July 2011)

2. Professional Society Membership

Botanical Society of America

International Mycorrhiza Society (Life Member)

Mycological Society of America

3. Other Professional Activities

a. Editorial activity

<u>Journal (s)</u>	<u>Responsibility</u>
Mycorrhiza	Editorial Board

Other (books, symposia, etc.)

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Agriculture, Ecosystem and Management	1
Mycorrhiza	2
Ecology	1
Molecular Ecology	1
New Phytologist	1

<u>Agency</u>	<u>No. of proposals</u>
NSF (Panel Assignments)	14

Other  
NSF Population and Community Ecology Panel, Spring 2011.

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
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C. Further Education/Re-training Undertaken, Leaves, Workshops, etc.

D. Foreign Travel (Where, When, Purpose)

Honduras, June 2010, I travelled to Honduras to teach a Molecular Techniques course at a remote research station in Cusuco National Park. I set up the lab, verified that everything was functioning properly, and taught the first batch of students taking the DNA lab in week one. Anna Conrad (EFB class of 2010) worked with me and taught the DNA course in weeks 2 – 5.

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

A. Department-level

GPAC

Mentor for Martin Dovciak and Melissa Fierke

Reviewed teaching: Greg McGee, Lee Newman

Maintenance/operation of the two new growth chambers (5 and 6)

Chair: Josiah L. Lowe Hugh E. Wilcox Graduate Scholarship Endowment committee

B. College-level

ARB Core team (spotty participation but many meetings were attended in part or in whole)

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 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, which I'll continue to award based on your contributions to the department and college this reporting period.

Students

Mentoring students to help them achieve their goals is one of the great pleasures of the job. After graduation last spring, Anna Conrad and I headed to Honduras where she helped me set up a field-based DNA teaching lab ("Barcoding the Diversity of Cusuco Cloud Forest") for Operation Wallacea. After I taught the first cohort of students, she took over and independently taught another 5 groups with great success. She then headed off for her MS program in a colleague's lab at Ohio State University. Mikey O'Brien (MS 2009) landed a PhD position in Switzerland with fieldwork in Borneo and published the first chapter of his thesis in Plant and Soil in early 2011. Tera Galante (MS 2009) also landed a PhD position, this time at the University of Wisconsin, Madison. She just had the first chapter of her thesis accepted for publication in Mycologia. Lorien Sopchak finished her MPS in spring 2010 and just got accepted to vet school, a fulfillment of a dream of hers that came to light during her MPS work. Joe Vineis successfully defended his MS this year, and immediately landed a very competitive job in a DNA sequencing lab at the Bay Paul Center, Marine Biological Laboratory in Woods Hole, MA. Chris Hazard (MS 2006) is now Dr. Hazard with a PhD degree from University College Dublin, Ireland and is headed for a 3-year postdoctoral position at the University of Aberdeen, Scotland. Andy Cortese (BS, Forest Health, Fall 2010) landed an MS position in WA working on a mycorrhizal project. Similarly, Angela Vitale (senior EFB) is spending her summer working in a lab in Moscow Idaho. Perhaps not so coincidentally, the technician in the Idaho lab is Sara Ashkannehad, my first student (MS 2003). I enjoy giving students research experience in my lab, including this year's cohort of undergrads: Ashley Campbell, Zhen Yu Lim (Amos), Alena Oliver, Erin Sweeney, Joelle Chille and Justin West. This year I also made many students aware of the EcoLog list serve where they can keep up on internships and research experiences advertised across the country. My understanding is that quite a few students landed good positions for summer work through this list serve. All mentoring requires varying amounts of time to help the students along as they pursue their goals. Finally,

I really enjoyed a couple of non-research, non-academic experiences this year. The first was accepting an invitation to be the faculty advisor for the Central New York Conservation Biology club. This is a club with a great mission and dedicated group of students. Also, I enjoyed going to the Fall Retreat at Orenda Springs, where a 2-hour commitment turned into a full day of fun with the students. The day ended with some time on the ropes course and there is a great picture of me and one of my unofficial undergraduate advisees (Mike Norman) reaching to clasp hands while dangling about 15 meters up in the air (I'm the little guy on the left!). The photo captured the spirit of the day where new students meet faculty and are welcomed to ESF.

#### Department/College

My primary commitment at the Department/College level is teaching General Ecology, EFB 320. The class was the largest ever this past fall at 278 students. Despite the large class size, it was a very interactive group and I was able to facilitate quite a bit of discussion/inquiry during lectures. I had a number of students tell me that this course was incredibly important to their development as ecologists and one recently suggested it is a flagship in the program, due in large part to my lectures and labs. In addition, I received positive feedback about EFB 320 during and after my guest lecture in Principles of Evolution. I also participate in the Graduate Program Advisory Committee and I am a member of the Academic Research Building Core team. The GPAC has made great progress this year with a solid program for incoming graduates in the Core course, a reworked TA evaluation form, and a wiki page to guide grad students on the road to their degrees. The number of meetings associated with the ARB was...impressive. Getting the proper design and functionality of a research building is critical. A lot was accomplished and it looks like we are well along the path of initiating the construction of a great research building. Finally, I strongly believe that through scholarship we make ESF a known entity as a research institution. I was honored with an invitation to serve on a spring NSF panel this year. These are largely volunteer efforts that require a tremendous amount of time reviewing proposals and preparing for the face time in Washington DC. I think this effort helps maintain our position as a quality research institute.

#### Self professionally

My work continues to receive excellent recognition as recorded in the Web of Science citation index (Web of Science data based on 24 papers recovered, June 2011: 1447 citations, average citations per item = 60.29, H-index = 15). This year, I managed to get five refereed papers accepted for publication this year. Two of these were published in a special issue on Conservation of Fungi in Fungal Ecology. Other than the editors of the journal, I am the only author with 2 papers in this special issue. Two others were chapters from former students (O'Brien and Galante), and one was a chapter from a PhD student at Rutgers (Karpati). I also co-authored a chapter on soil and mycorrhizae with Russ Briggs in Castello and Teale (2011) Forest Health. I also co-authored and submitted a McIntire Stennis proposal with Ruth Yanai that was selected for funding. This project dovetails into a large NSF-funded manipulation study with nutrient additions in NE forests and we are adding a mycorrhizal component. I am excited about the results we will see from this small foray into the role of mycorrhizal fungi in nutrient cycling and the possibility of using these data for a larger proposal for NSF. I was invited to speak on Mycorrhizal Networks in this year's Botanical Society meeting in St. Louis in a symposium titled 'Incorporating microbes in plant community ecology'. As it happens, I was also contacted by a representative from Springer to brainstorm book ideas at about the same time as the symposium invitation. I decided the time was right for a book on Mycorrhizal Networks with strong encouragement from the Springer representative and submitted my proposal for a contributed author book with this title. If the book idea is accepted, I believe this will keep me strongly positioned as leader on the topic. All but two authors readily agreed to contribute chapters for the book on my request and the author list is a group of international leaders in the field.

### **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 2011

- a. Course(s) to be offered
- b. Proposed research activity

Continue writing papers (three papers in final review with co-authors)  
Continue work on NSF grant with Jeremy Hayward, Martin Nuñez and Dan Simberloff  
Train students for mycorrhizal/molecular work on McIntire-Stennis project with Ruth Yanai  
Submit proposal on mycorrhizal specificity to NSF (in preparation with PhD student Jeremy Hayward)  
Attend annual meeting of the BSA, Give symposium presentation and attend various symposia and contributed talks.

- c. University, professional society, and public service

ARB Core committee  
MSA Councilor, Ecology and Plant Pathology  
Faculty Representative for CNY Mycological Society

## 2. Fall Semester 2011

- a. Course(s) to be offered

EFB 320: General Ecology  
EFB 496: Advanced Mycology: Basidiomycetes  
Various 420, 498, 899, 999 courses

- b. Proposed research activity

Edit book on Mycorrhizal Networks, write my portions.  
Continue writing papers (three papers in final review with co-authors)  
Continue work on NSF grant with Jeremy Hayward, Martin Nuñez and Dan Simberloff  
Train students for mycorrhizal/molecular work on McIntire-Stennis project with Ruth Yanai

- c. University, Professional society, and public service

ARB  
GPAC  
EFB Faculty meetings  
Faculty Representative for CNY Mycological Society  
Beaver Lake Mushroom Fair, Sept. 18

## 3. Spring Semester 2012

- a. Course(s) to be offered

EFB 797: Advanced Mycology  
Various 420, 498, 899, 999

- b. Proposed research activity

Edit book on Mycorrhizal Networks and submit manuscript by early summer.  
Continue writing papers (three papers in final review with co-authors)  
Continue work on NSF grant with Jeremy Hayward, Martin Nuñez and Dan Simberloff  
Continue work on McIntire-Stennis project with Ruth Yanai

- c. University, professional society, and public service

ARB



GPAC  
EFB Faculty meetings  
Faculty Representative for CNY Mycological Society