

ANNUAL REPORT: June 1, 2012 – May 31, 2013
(i.e., Summer 2012, AY 2012-2013)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: DANILO D. FERNANDO

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>
SUMMER:	- none				
FALL:	- none				
SPRING:	EFB 326	Diversity of Plants	3	55	4
	BTC 497	Research Design & Prof Dev't	3	13	0

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>
FALL	EFB 498	Independent Research	3	1
	EFB 899	Masters Thesis Research	1-5	3
	EFB 999	Doctoral Thesis Research	1	1
SPRING	BTC 498	Independent Research	3	1
	EFB 495	Experience in College Teaching	3	1
	EFB 899	Masters Thesis Research	1	2
	EFB 999	Doctoral Thesis Research	1	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>
EFB 210	Diversity of Life	2
EFB 535	Flowering Plants: Diversity, Evolution and Systematics	1
BTC 132	Biotechnology Orientation Seminar	1
BIO 340	Plant Kingdom (at SUNY Oswego)	1

II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student's official advisor 13 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

Jeremy J. Discenza, MS, Started Fall 2010.

Completed Fall 2012: INTER-SIMPLE SEQUENCE REPEAT ANALYSIS OF GENETIC DIVERSITY WITHIN AND BETWEEN EIGHT NEW YORK POPULATIONS OF *ASPLENIUM SCOLOPENDRIUM* VAR. *AMERICANUM*

Arnold M. Salazar, Ph.D., Started Spring 2007.

Completed Spring 2013: ISOLATION AND CHARACTERIZATION OF SECRETORY PROTEINS INVOLVED IN LOBLOLLY PINE (*PINUS TAEDA*) POLLEN GERMINATION

Jessica R. Bouchard, MS Program, Started August 2011

Rie Iriyama, MS Program, Started August 2011

Stephanie Smith, MS Program, Started January 2012

CO-MAJOR PROFESSOR

Kyle Kolwaite, MPS

MEMBER, STEERING COMMITTEE (other than those listed above)

Collin Fischer, Ph.D. Program, Started August 2005 – Chemistry Dept (SB3 Program), SU

Nikhilesh Dhar, Ph.D. Program, Started August 2006 – Biology Department, SU

Pallavi Subramanya Bharadwa, Ph.D Program, Started August 2012 – Biology Dept, SU

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Tanuschree Chowdhury (PhD Candidate) – Division of Environmental Science, ESF

III. RESEARCH COMPLETED OR UNDERWAY

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

Cloning and bioinformatic analysis of secreted proteins from pine pollen tubes (10%)

Cloning and bioinformatic analysis of microRNAs from pine pollen tubes (10%)

Development of a pollen derived cell line from Ginkgo (10%)

In vitro regeneration and transformation of willow (10%)

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)

Genetic Diversity, Morphometrics, and Habitat Analysis of a Rare Fern in the Northern Forests: Implications for Management and Long-Term Survival. USDA Forest Service Northeastern States Research Cooperative, \$82,876. September 1, 2011 – August 31, 2013. PI: DD Fernando, Co-PIs: DJ Leopold and SW Bailey. Arnold Salazar (PhD student, supported for one-month) and Jessica Bouchard (MS student, supported for three semesters) and one week for summer 2013.

Genetic, Reproductive and Habitat Analysis to Support American Hart's-Tongue Fern Reintroduction and Restoration in the Great Lakes Region. USF&WS-GLRIP, \$99,600. May 1, 2012 to June 30, 2014. PI: DD Fernando, Co-PI: DJ Leopold. Grad Students: Thomas Brumbellow and Rie Iriyama (both are MS students and each supported for two semesters).

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)

Climate Profile and Clinal Variation among Populations of a Rare Fern at the Edge of its Range in the Northern Forests. Northeastern States Research Cooperative \$10,000 by Jessica Bouchard and Danilo Fernando.

Genetic Diversity of Eastern White Pine Old-Growth Forests in the Adirondacks and Implications for Biologically Sustainable Forest Management. USDA McIntire-Stennis, Danilo Fernando, Chris Nowak and Rene Germain.

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

Seago JL and Fernando DD. 2013. Anatomical Aspects of Angiosperm Root Evolution. Invited Review: *Annals of Botany* (published online/doi:10.1093/aob/mcs266).

Fernando DD and Owens JN. The Reproductive Process in Temperate, Southern and Tropical Pines. Invited Review for *New Forests* (in review).

Quinn CR and Fernando DD. Computational Predictions and Expression Patterns of Conserved MicroRNAs in Loblolly Pine (*Pinus taeda*). *Tree Genetics and Genomes* (in review).

Quinn CR and Fernando DD. Expression of Conserved MicroRNAs in the Male Gametophytes of Loblolly Pine (*Pinus taeda*). *Annals of Botany* (in review).

B. Non-refereed Publications

None

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

Invited Speaker: Breeding for Value in a Changing World, Breeding and Genetic Resources of Southern and Mexican Pines, International Union of Forest Research Organizations, Working Group 2.02.20, Jacksonville, FL, Feb. 3-7. Title of Presentation: *Pinus*: Reproductive Process, Crossability and Related Approaches.

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

Production of Genetically Diverse American Hart's Tongue Fern for Introduction into the Great Lakes Area. Presented during the American Hart's Tongue Fern Meeting held at SUNY ESF, March 21-22, 2013. Organized by the New York State Office of Parks, Recreation and Historic Preservation: Central Region c/o Dr. Tom Hughes.

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.

Orientation for New EFB Graduate Students (August 2012) – topics covered include: Graduate program degree requirements, policies and forms (2A, 3B, 4 and 5A)

EFB Open House, Oct. 27, 2012. Represented the Biotechnology program.

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)

2. Professional Society Membership

3. Other Professional Activities

a. Editorial activity

Journal (s)

Responsibility

Other (books, symposia, etc.)

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Proteomics	1
Flora	1
<u>Agency</u>	<u>No. of proposals</u>
USDA McIntire Stennis	1
NSF	20
<u>Other</u>	

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)

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

Director, EFB Graduate Program
Member, Graduate Program Advisory Committee
Coordinator, Committee on Optical Instruments and Equipment

B. College-level

Member, Graduate Council

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.

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.

For the Students: This past academic year, I taught Diversity of Plants (EFB 326) and Research Design and Professional Development (BTC 497). Besides the interactions with the students in the lectures, I also interacted with the students during their labs through involvement in some of the lab activities (EFB 326) or writing assignments and interviews (BTC 497). Some of my students came in during my office hours for clarifications/short questions or conversations on certain topics. I have trained several undergraduate students in my lab through independent research and internship, presented invited lectures to other courses (in ESF and SUNY Oswego), and advised at least 13 undergraduate students in various aspects of their curriculum. I also advised many graduate students from the department regarding their program requirements, filling up the required forms, and shifting from one major or degree program to another. I worked with my five graduate students (4 M.S. and 1 Ph.D.) on various aspects of the laboratory and/or field components of their research projects, draft manuscripts, grant/fellowship applications, and poster presentations. In total, at least 100 students have been served under various capacities.

For the department/college: I served as EFB's Graduate Director for the sixth year and my major responsibilities included the following: 1) acted on various types of petitions concerning different aspects of our graduate program requirements and policies; 2) reviewed and signed on various forms required for the completion of different degrees and majors (2A, 3B, 4 and 6A); 3) replied to inquiries concerning our graduate program (through email, phone, and/or personal visits) on an almost daily basis from several potential applicants and current graduate students; 4) processed a total of 127 applications (15 for spring and 112 for fall) that involved the review of each application for initial assessment and designation of faculty reviewers, followed up on the completion of the reviews on each application, summarized the reviews for each application, and submitted EFB's recommendation for each accepted and rejected applications to the Dean of Instructions and Graduate Studies; and 5) provided orientation seminars to new graduate students about our graduate program and the new faculty about the graduate application pipeline. I served as the department's representative to the Graduate Council and raised issues regarding problems/suggestions on how to improve the graduate program, application and review process; shared the ideas and activities of the Graduate School to the department's graduate committee and faculty. I also worked with the EFB Graduate Secretary on the update and improvement of the various facets of the EFB's Graduate Webpage, graduate application filing system, and continued the survey on the most effective means of attracting/recruiting graduate students. As a member of EFB's Graduate Program Academic Committee, I provided connections between department and college on issues pertaining to graduate degree program offerings and requirements, admission/review process, policies, and other related matters.

For professional accomplishments: The following are what I consider as significant: 1) Successful completion of my third M.S student – Jeremy J. Discenza (Fall 2010 to Fall 2012); 2) Successful completion of my third Ph.D. student – Arnold M. Salazar (Spring 2007 to Spring 2013); 3) Invited to write a review paper for Annals of Botany with co-author Dr. Jim Seago (already available online, Annals of Botany); 4) Invited to write a review paper for New Forests with co-author Dr. John Owens (in review); 5) One of the invited speakers during the IUFRO Working Group 2.02.20 on Breeding and Genetics on Southern Pines' Annual Meeting in Jacksonville, FL; 5) Invited as Panel Review Member for NSF's Plants, Fungi and Microbial Evolution and Developmental Mechanisms; and 6) Finished eight chapters (out of 12) of the textbook (Sexual Reproduction in Forest Trees) that I am co-authoring with Dr. John N Owens through a contract with the Cambridge University Press.

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 2013

a. Course(s) to be offered

- none

b. Proposed research activity

- continue writing textbook
- revise lab manual for Diversity of Plants
- work with graduate students on their research and manuscripts

c. University, professional society, and public service

- continue the function as Graduate Program Director in terms of signing on forms, reviewing and processing graduate applications, and work on further improvement of EFB's grad webpage.

2. Fall Semester 2013

a. Course(s) to be offered

- None since I will be on sabbatical.

b. Proposed research activity

- continue writing textbook
- revise lab manual for Diversity of Plants
- work with graduate students on their research and manuscripts
- write grant proposals for NSF, USDA/AFRI and/or DOE

c. University, Professional society, and public service

- none since I'll be on sabbatical

3. Spring Semester 2014

a. Course(s) to be offered

- EFB 326 (Diversity of Plants)
- BTC 497 (Research Design and Professional Development)

b. Proposed research activity

- work with graduate students on their research and manuscripts
- write grant proposals for NSF, USDA/AFRI, and/or DOE

c. University, professional society, and public service