

ANNUAL REPORT: June 1, 2011 – May 31, 2012
(i.e., Summer 2011, AY 2011-2012)
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:	EFB 427/627	Plant Developmental Biology	3	18	2
SPRING	EFB 326	Plant Diversity	3	73	4
	EFB 796	Plant Genomes, Evolution & Biodiversity	3	5	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. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

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:	BTC 420	Internship in Biotechnology	3-5	3
	BTC 498	Research Problem/Biotechnology	3	2
	EFB 798	Research Problem/EFB	3	3
	EFB 899	Masters Thesis Research	2-9	3
	EFB 999	Doctoral Thesis Research	1	2
SPRING:	BTC 498	Research Problem/Biotechnology	3	1
	EFB 495	Undergraduate Teaching Exp	3	3
	EFB 798	Research problem/EFB	3	1
	EFB 898	Professional Experience	3	1
	EFB 899	Masters Thesis Research	3-8	4
	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 I	2 plus one lab
EFB 535:	Flowering Plants: Diversity, Evolution, and Systematics	1
BIO 340:	Plant Kingdom (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: (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

Christina R. Quinn, Ph.D. Program, Started August 2006
 Arnold M. Salazar, Ph.D. Program, Started January 2007
 Jeremy Discenza, MS Program, Started August 2010
 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

NONE

MEMBER, STEERING COMMITTEE (other than those listed above)

Collin Fischer, Ph.D. Program, Started August 2005 – Chemistry Department (SB3 Program), SU
 Nikhilesh Dhar, Ph.D. Program, Started August 2006 – Biology Department, SU

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Tanushree Chowdhury – PhD, ESC Environ & Community Land Planning, Defense Chair

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 (15%)
 Cloning and bioinformatic analysis of microRNAs from pine pollen tubes (15%)
 Development of a pollen derived cell line from Ginkgo (15%)

- 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)

Confronting the obstacles to willow genetic transformation (Tim Volk, co-PI). USDA McIntire-Stennis, \$50,591. May 15, 2010 - Sep 12, 2011. Graduate Research Assistant – Arnold Salazar (Ph.D. student,

supported for two semesters)

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-semester) and Jessica Bouchard (MS student, supported for three semesters).

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. Thomas Brumbellow (MS student supported for two semesters).

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

- NONE

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

Establishing the microRNAs and their roles in vascular cambium activity in willow. USDA AFRI NIFA \$150,000. Submitted June 7, 2011.

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

Quinn CR and Fernando DD. Computational prediction of conserved microRNAs and their targets in *Pinus taeda*. Tree Genetics and Genomes (under review).

Quinn CR and Fernando DD. 2012. Novel and differentially expressed microRNAs in germinated loblolly pine (*Pinus taeda*) pollen. New Phytologist (under review).

B. Non-refereed Publications

None

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

NONE

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

NONE

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

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

NONE

2. Industrial and Commercial Groups, etc.

NONE

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

None

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

International Journal of Plant Developmental Biology (IJPDB)

Member, Editorial Board

Other (books, symposia, etc.)

b. Reviewer

Journal(s)

No. of manuscripts

Plant Cell Reports
Scientia Horticulturae

1
1

Agency

No. of proposals

Consortium of Plant Biotech Research, Inc. 1

Other

c. Participation (workshops, symposia, etc.)

Name of workshop, etc.

Date

Place

NONE

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

NONE

D. Foreign Travel (Where, When, Purpose)

NONE

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
Review Committee for SUNY Diversity Fellowship
Review Committee for Bristol Myers Squibb Sustainability Fellowship

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 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.

For the Students: This past academic year, I taught Plant Anatomy and Development (course reformatted from Plant Developmental Biology) and Plant Diversity, trained several undergraduate students in my lab through independent research and internship, presented invited lectures to other courses (both in ESF and outside of ESF), and worked with my six graduate students (4 M.S. and 2 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 120 students have been served under various capacities.

For the department/college: I served as the Director of our graduate program for the fifth 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 (paper form and online) various forms required for the completion of different majors and degrees (2A, 3B, 4, 5B and 6B), 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 153 applications (21 for spring and 132 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, 5) provided orientation seminars to new graduate students about our graduate program and the new faculty about the graduate application process, 6) 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, 7) reviewed applications and participated in the deliberations in granting Fellows for SUNY Diversity Fellowship and Bristol Myers Squibb Sustainability Fellowship; and 8) worked with the 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.

For professional accomplishments: The following are what I consider as significant: 1) Successful completion of my second Ph.D. student – Christina R Quinn (August 2006 to Fall 2011); 2) Submission of two papers (out of Christina's dissertation project) and two more that I'm currently editing/revising; 3) As for the textbook (Sexual Reproduction in Forest Trees) that I am writing with my co-author Dr John N Owens (through Cambridge University Press), six chapters have already been written and seven more to go; 4) Two grant proposals (USF&WS-GLRIP and USDA-NSRC) have received successful reviews and total grant funding awarded was \$182,476.00; and 5) three new graduate students (Jessica Bouchard, Rie Iriyama and Stephanie Smith) joined my lab this year, which in total, I have six graduate students - the most that I have thus far in one calendar year.

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).

For the next academic year, the bulk of my time will be spent in the following activities: 1) teaching, 2) research, 3) graduate admissions, and 4) textbook writing.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2012

a. Course(s) to be offered:

None

b. Proposed research activity:

In vitro regeneration of willow, Genetic diversity of American harts-tongue and frant cliff ferns, Mechanism of pine pollen germination - roles of microRNAs and secretory proteins, grant proposal preparation, and textbook writing. Participation in field work related to Dryopteris fragrans in the Adirondacks and Maine.

c. University, professional society, and public service:

Review of graduate applications, participate in the activities of GPAC and Graduate Council.
Review of grant proposals and manuscripts

2. Fall Semester 2012

a. Course(s) to be offered:

Diversity of Life 1: Will cover 2 lec and 1 lab on Lycophytes, Pteridophytes & Gymnosperms.
BTC/EFB 498: Independent Research

b. Proposed research activity:

In vitro regeneration of willow, Genetic diversity of American harts-tongue fern and fragrant cliff fern, Mechanism of pine pollen germination - roles of microRNAs and secretory proteins, grant proposal preparation, and textbook writing.

c. University, Professional society, and public service:

Review of graduate applications, participate in the activities of GPAC and Graduate Council.
Review of grant proposals and manuscripts

3. Spring Semester 2013

a. Course(s) to be offered:

EFB 326: Plant Diversity

BTC 497: Research Design and Professional Development

b. Proposed research activity:

In vitro regeneration of willow, Genetic diversity of American harts-tongue and fragrant cliff ferns, Mechanism of pine pollen germination - roles of microRNAs and secretory proteins, grant proposal preparation, and textbook writing.

c. University, professional society, and public service:

Review of graduate applications and participate in the activities of GPAC and Graduate Council.
Review of grant proposals and manuscripts