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

NAME: William A. Powell

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
SUMMER:				
FALL:				
EFB307	Principles of Genetics	3	195	
EFB307	Genetics Lab	1	179	9
BTC132	Orientation Seminar:	1	16	
SPRING:				
EFB796	Presenting Research to the Public	2	(Cancelled due to only 2 registered. Student comments that it didn't count as a seminar, so next year will change to EFB797.)	

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
BTC298	Research Apprenticeship Biotech	4	2
EFB420	Internships in EFB	1	1
BTC420	Internships in Biotechnology	14	4
EFB498	Research Problems/ EnvBio	1	1
BTC498	Research Problems/ Biotech	12	7
EFB798	Reseach Prob/Env &For Bio	1	1
EFB899	Masters Thesis Research	28	4
EFB999	Dissertation Research	11	2

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

Hosted 5 High School interns over the 2014 summer: Jennifer DeRosa , Meg Lovier, Elyse DuBois, Kaitlyn Nea, (Skaneateles High School students), and Alex Fontana (Manlius High School)

4. Guest Lecture Activities

Course No.	Title	No. of Lectures

II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student's official advisor __17___ and unofficial advisor __68_ (as coordinator of Biotechnology major)___

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

1. Tyler Desmarais, MS, started August 2014
2. Vernon Coffey, MS, started August 2015
3. Yokshitha Reddy Bathula, August 2015
4. Dakota F. Matthews, MS, August 2015
5. Andrew Newhouse, Ph.D., August 2015

CO-MAJOR PROFESSOR

1. Allison Oakes, PhD, (with Dr. Maynard), started May 2009
Graduated Fall 2015, Dissertation: Oakes, A.D. An Investigation of Micropropagation Techniques for American Chestnut. 257 pages, 3 tables, 68 figures, 2015

MEMBER, STEERING COMMITTEE (other than those listed above)

1. Oluwafunmilayo (Funmi) Adeogo Afelumo, MS, started Jan 2013, graduated Dec. 2015

2. Amanda G. Gray, MS, started Aug. 2013, graduated May 2015

3. Andrew Tomes, MS, August 2013.

4. Gabrielle FanFan, MS, Jan. 2014

5. Wenjun Cai, PhD, started May 2011

6. Andrew Tomes, MS, started Aug. 2013

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

1. Mingyu Li (PhD defense, Chair)

VISITING SCHOLARS:
Dr. Qingqin Cao (China)
Christie-Anne Lovat (Canada)

III. RESEARCH COMPLETED OR UNDERWAY

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

Starting some preliminary work on Ozark Chinquapin, which was also devistated by chestnut blight. Looking for future funding. Approximately 1% of time.

Research using *Bacillus amyloliquefaciens* and another Endophyte to determine effect on growth of American chestnut. Approximately 1% of 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)

1. The New York Chapter of The American Chestnut Foundation. Getting Events in the Ground and Tested. $210,000 (8/1/12-7/31/15). Ended this year but receiving another $25K this summer for seed production orchards. Co-PI with Dr. Maynard as PI. One graduate assistant.
2. USDA-Biotechnology Risk Assessment Grant program (BRAG), Evaluating Environmental Impacts Of Maturing Transgenic American Chestnut Trees Relative To Chestnut Trees Produced By Conventional Breeding. $500,000 (9/1/12-8/31/14 – no cost extension to 8/31/16). PI with co-PIs, Dr. Maynard, Dr. Parry, Dr. Briggs, Dr. Nowak, and Dr Tschaplinski (ORNL). Finishing this summer. Lead to NSF proposal by Dylan Parry. Two graduate assistants.
3. Forest Health Initiative. Phase II: Supplemental - Transgenic American Chestnut leaf assays. $30,000 (1/1/15 – 12/31/15). Terminating this year. PI with Dr. Maynard Co-PI
4. USDA IR-4 project. Regulatory studies for the transgenic American chestnut. $29,000 (5/1/15-4/30/16). PI. Asking for an additional $15K this year.
5. Crowd Funding, 10,000 Chestnut Challenge. $113,000 to date with more donations possible. PI with Dr. Maynard as co-PI.
6. The American Chestnut Foundation, Stanback Grant. The American chestnut research. $50,000 (7/1/14-6/31/15). PI with Dr. Maynard as co-PI. (possible renewals for 5 years, total $250,000). One graduate assistant.
7. The American Chestnut Foundation, Stanback Grant. The American chestnut research. $200,000 (10/1/15-9/3/16). PI with Dr. Maynard as co-PI. (possible renewals for 5 years, total $250,000 with above). Two graduate assistants and technician.
8. New York State legislation line item. American chestnut research and restoration project. $100,000 (7/1/15 – 6/30/16, renewed this year for another $100K). Post-doc. PI with Dr. Maynard as co-PI.
9. Mississippi Fish & Wildlife, Testing for deregulation of blight resistant American chestnut. $60,000 from 7/1/15-8/30/16, just renewed for 2 more years ($120,000). One graduate student. PI.
10.

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

DOE Bioenergy Research Center pre-proposal called Triangle Renewable Energy Science Center. Collaboration with NC State (lead institution) and other universities. Estimated total grant is $13M with about $1M coming to ESF over 5 years ($200,000/year). Fund postdocs, technicians, and/or graduate students.

Working with the ESF development office and TACF to find donors to the Chestnut Project. Goal is to raise $3M over the next 5 years.

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

Oakes, Allison D., Tyler R. Desmarais, William A. Powell, Charles A. Maynard. "Ex vitro rooting of American chestnut improves acclimatization survival and plantlet quality". Journal of Environmental Horticulture. In review.

Oakes, A.D., T. Desmarais, W.A. Powell, and C.A Maynard. 2016. Improving Rooting and Shoot Tip Survival of Micropropagated Transgenic American Chestnut Shoots. HORTSCIENCE 51:1–6

B. Non-refereed Publications

Powell, W.A. New genetically engineered American chestnut will help restore the decimated iconic tree. The Conversation. 1/19/16.

Link: https://theconversation.com/new-genetically-engineered-american-chestnut-will-help-restore-the-decimated-iconic-tree-52191

20,152 readers (top ESF Conversation article), Facebook: 1.3K posts, twitter posts: 245, linkin posts: 141

Interviews leading to **38** (possibly more) popular press articles, blogs, radio and TV shows (there were 31 last year):

The Chestnut Project in the News links (5/14/15 – 5/10/16)

- USDA Blog: Will Chestnuts Roast on an Open Fire Again Someday?
- National Academy of Sciences: Genetically Engineered Trees
- Staten Island Live: Is the American chestnut found on Staten Island?
- Daily Orange: SUNY-ESF researchers look to restore American chestnut tree population
- New Yorker: Unnatural Selection: What will it take to save the world's reefs and forests?
- 27East: Notes On The Long Island Natural History Conference: Restoring The American Chestnut
- R&D Magazine: Restoring the American Chestnut
- Headlines & Global News: Genetic Engineering Could Revive American Chestnut Trees
- Business Insider: Genetic engineering could save an iconic American tree from extinction
- GardenRant: GMO Trees
- Phys.org: New genetically engineered American chestnut will help restore the decimated, iconic tree
- The Conversation: New genetically engineered American chestnut will help restore the decimated, iconic tree
- Our Little Acre: Roasting, Planting, and Restoring the American Chestnut
- Concord Monitor: Chestnut trees planting a comeback?
- TakePart: Here's How to Crack the Ultimate Holiday Nut
- Plant Science Today: Best of Plants 2015: Outreach and Communication
- Wall Street Journal: Readers Sound Off on Bears, Schools, Trees and More
- News Channel 10: Near-extinction makes chestnuts a relic of Christmas' past
- Plant Science Today: Chestnuts featured in #AdventBotany
- Lohud: Two Westchester groups are helping to save the American chestnut tree
- News flash: genetic engineering may save the American chestnut tree
- Bay Journal: Back-cross American chestnut project raising hopes for tree's restoration
- Sierra Club Atlantic Chapter: The Mighty American Chestnut: New York conservationists lead epic tree restoration effort
- Smithsonian: The Race to Save the World's Great Trees By Cloning Them

- Sydney Morning Herald: A hole in the horizon
- Genetic Literacy Project: Anti-GMO forces can slow train of technological progress but cannot derail it
- Leader in American Chestnut Restoration To Receive ESF's Feinstone Award
- The Quiet Branches: Bringing back a forest
- NY Times: Dead Forests and Living Memories
- BIOTech Now: Could GMOs Save Endangered Plants and Animals?
- Ensia: In the race to save species, GMOs are coming to nature
- Oneonta Daily Star: Rebuilding our forests
- Talking Biotech: Saving the American Chestnut; Lettuce History and Modern Improvement
- Auburn Citizen: Eco Talk: Bringing back the American chestnut tree
- NPR: Once And Future Nut: How Genetic Engineering May Bring Back Chestnuts
- Genetic Literacy Project: Government approval next step in approving GM revival of American chestnut
- National Geographic: Can We Engineer an American Chestnut Revival?
- Genetic Literacy Project: Wheat genes could help revive American chestnut

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

1. Where There Be Mountains, There Be Chestnuts. **Invited speaker**. 5/31/15 – 6/3/15. Biotech Literacy Project Boot Camp, University of California, Davis.

2. The Return of the American chestnut. **Keynote Speaker**.6/8/15-6/9/16. Project Learning Tree conference. Saratoga Springs, NY

3. Update on the American chestnut project progress. 7/20-21/15. Annual Forest Health Initiative (FHI) Board meeting. Washington DC

4. The American Chestnut Research and Restoration Project. 7/28-29/15. Meeting with the Monsanto regulatory experts to help learn what is needed to go through the federal regulatory process. Gave a presentation to employees and researchers from the Danforth Plant Science Center. St. Louis, MO.

5. Meeting with the EPA, FDA, and USDA APHIS BRS representatives. Gave presentation on the American chestnut and discussed what is needed for a regulatory review. 10/21/15. Washington DC.

6. Presented a webinar for the National Academies of Science GE Crop Study, GE tree section. 3/27/16. Link: http://nas-sites.org/ge-crops/2015/01/27/webinar-march-27-ge-trees/

7. Using the tools of Genetic Engineering to help Save the American Chestnut. 5/19-20/16. **Plenary speaker**. NYS Biotechnology Symposium. Syracuse, NY.

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

1. Talking Biotech Podcast with Kevin Folta: 010 Saving the American Chestnut, recorded 6/10/15, broadcasted 7/25/15. Link: http://www.talkingbiotechpodcast.com/?s=chestnut , large potential web audience, numbers ?

2. The American Chestnut Research and Restoration Project. 6/17/15. Annual ReLeaf Conference **invited speaker** and tours. Syracuse, NY, approximately 60 attending.

3. Video Interview for Feinstein Award about the chestnut project and Herb Darling, the awardee. 9/4/15, presented at

the Feinstein Award Dinner 10/15/15. Syracuse, NY, approximately 60 attending

4. Updates on the American chestnut Project and lab and field tours. Annual meeting of the New York Chapter of The American Chestnut Foundation. 10/17/15. Syracuse, NY, approximately 50 attending.

5. Using the tools of Genetic Engineering to help Save the American Chestnut. **Invited Speaker**. Annual meeting of The American Chestnut Foundation (national). 10/23-24/15. Penn State University, PA, approximately 200 attending.

6. Four Skype presentations and Q&A to classes at FFCS Middle school (Jaime Linart teacher), about the chestnut project. 1/21/16. Syracuse, NY, approximately 90 students total.

7. Where There Be Mountains, There Be Chestnuts. **Invited Speaker**. Today's Horticulture Symposium. 2/5/16. Longwood Gardens, PA. Over 320 attending and they also had live web links. Video: http://hosting.desire2learncapture.com/longwood/1/Watch/729.aspx#.VsSDilF0ui4.twitter

8. American chestnut leading the way to a healthier forest, **Invited Speaker**, Long Island Natural History Conference. 3/18-19/16. Estimated 300 attending. Article about my talk at the conference: http://www.27east.com/news/article.cfm/East-End/474015/Notes-On-The-Long-Island-Natural-History-Conference-Restoring-The-American-Chestnut

9. Presenting the Chestnut project and campus lab tours to Central Square High School teachers. 3/24/16. 10 attending.

10. Skype chestnut presentation and Q&A to SUNY Buffalo "Genetics and the Law class." 12 attending.

11. Using the tools of Genetic Engineering to help Save the American Chestnut. **Invited Speaker**. Annual meeting of The American Chestnut Foundation (PA/NJ chapters). 4/2/15. Approximately 80 attending.

12. Using the tools of Genetic Engineering to help Save the American Chestnut. **Invited Speaker**. Annual meeting of The American Chestnut Foundation (GA chapters). 4/8/15. Approximately 60 attending.

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.

Advisor to the NY chapter of The American Chestnut Foundation

Science advisory board member of the national American Chestnut Foundation. Chair of the 3BUR committee whose charge is to find ways to integrate biotechnology, biocontrol, and breeding programs.

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
American Phytopathological Society
American Association for the Advancement of Science
International Society for Horticultural Science
American Society for Microbilogy

3. Other Professional Activities

a. Editorial activity

Journal (s)	Responsibility
Other (books, symposia, etc.)	

b. Reviewer

Journal(s)	No. of manuscripts

Agency	No. of proposals
USDA APHIS BRAG program – review panel	TBA

Other
Lowe-Wilcox/Zabel award student proposals

c. Participation (workshops, symposia, etc.)

Name of workshop, etc.	Date	Place

Presented

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

Coordinator for the undergraduate Biotechnology major

Fall Open House, representing the Biotechnology Major

Awards Ceremony: Presented the Distinguished Scholar Award in Biotechnology.

B. College-level

Director of the Council on Biotechnology in Forestry

Roosevelt Wild Life Station Scientist in Residence

IBC (Institutional Biosafety Committee) member

C. University-wide, including Research Foundation

Served on the Campus DRC evaluating Dr. Ivan Gitsov's promotion application.

D. Foreign Travel (Where, When, Purpose)

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:
In addition to my Genetics class, which I received very good reviews, I provide many opportunities for our students to have a "real life" research experience. This could only be done with the success of the American chestnut project that provides funding and research opportunities at many skill levels. We have had high school, undergraduate, graduate students, post-doc, and visiting scientists work on the project this year, giving them valuable experience for their future careers in addition to their satisfaction that they played an important part of the return of the American chestnut. I also started my first attempt at a course to teach our students how to present research to the general public. This is a skill that is lacking in most researchers today and I believe it contributes to the public's distrust of science. The course didn't get off the ground this semester because I didn't take into account that the graduate students needed a course that would fulfill their seminar requirement. I will correct this next year and hopefully pass on some of my 26 years of experience talking with the public about difficult science topics.

Department/College:
Again, the biggest contribution to our department and college is the success of the American chestnut project. This brings positive publicity to our college through my 19 pubic and professional presentations with about an equal number given by my students. This has lead to 38 'news" articles, up from 31 last year. Some are in very widely read publications such as The New Yorker, National Geographic, New York Times, Wall Street Journal, and Smithsonian. I was one of the first three ESF faculty to write an article for The Conversation which have gone over 20 thousand reads. My hope is that this outreach will help ESF to establish itself as a tree restoration center, and support spin-off projects such as the rescue of the Ozark Chinquapin and developing a blight resistant European chestnut in the near future, and working with other trees as the time goes on. Once we have regulatory approval, I hope ESF can establish the first demonstration of a Chestnut/Oak restoration forest planted on marginal lands and containing all the species associated with the American chestnut. Our students can follow this forest over the next century, continuously providing research opportunities as it matures.

Professionally:
Nobody on our campus understands the regulatory process for genetically engineered plants, so I have had to take on the task to self-educate myself. I am doing this with my Ph.D. student by meeting with the three regulatory agencies in person and by phone conferences. We are also visiting companies with experience with the review process to gain insights that the regulators might not offer. Lastly, we have sought out "pro-bono" regulatory consultants to help. Interestingly, there are many views about the best way to approach process. We hope to start the review soon as we have collected all the needed data. This is not only an administrative process, but also involves public relations, which you can see from our outreach efforts have taken much of my time. I believe we will be successful and will probably help change the public's opinion about genetic engineering and how it can be used to benefit the environment. But it will not be easy and there will likely be challenges to overcome as we go forward. But we are ready.

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

I will continue to offer research projects at the graduate, undergraduate, and high school.

b. Proposed research activity

I will continue to work with the government regulators (USDA, EPA, and FDA) to Sheppard the American chestnut tree through the review process.

We are also establishing our first seed orchards so that we can mass produce the blight resistant American chestnut trees once we have approval. It takes about 5 years for these orchards to start significant production, so this is the start.

I am also working on a collaborative DOE center grant with a group at NC State. This could provide an extra $1M in research funds as well as give me the experience of working on a center proposal. This will be helpful for our future goals of making ESF a restoration center.

c. University, professional society, and public service

Same high standards as before.

2. Fall Semester 2016

a. Course(s) to be offered

I will return to teaching EFB307 Principles of Genetics & EFB308 Genetics Lab, and the BTC132 Freshman seminar. I will also be offering a graduate seminar this fall with my students.

b. Proposed research activity

Same high standards as before focusing on chestnut and the regulatory review.

c. University, Professional society, and public service

Same high standards as before.

3. Spring Semester 2017 –

a. Course(s) to be offered

EFB797 Presenting Research to the Public.

b. Proposed research activity

I will continue all my research as before

c. University, professional society, and public service
as before