

**ANNUAL REPORT: June 1, 2014 – May 31, 2015**  
**(i.e., Summer 2014, AY 2014-2015)**  
**DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY**  
**SUNY-ESF**

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

NAME: Hyatt Green

NOTE: This report documents progress from Oct 1<sup>st</sup>, 2014 (beginning of employment) to May 31<sup>st</sup>, 2015.

**I. INSTRUCTIONAL ACTIVITIES**

1. Regular Course Offerings

Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
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SUMMER:

FALL:

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
<b>EFB 796</b>	<b>R and Reproducible Research</b>	<b>3</b>	<b>9</b>

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

4. Guest Lecture Activities

Course No.	Title	No. of Lectures
<b>EFB 211</b>	<b>Diversity of Life</b>	<b>1</b>

**II. STUDENT ADVISING**

A. Number of undergraduates for whom you are the student's official advisor 6 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

CO-MAJOR PROFESSOR

MEMBER, STEERING COMMITTEE (other than those listed above)

**Brandon Haynes, MS, ERE. Defends Summer '15**

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

**Second reader for Chem. Honors thesis, Jennifer Mathe, May 2015**

**III. RESEARCH COMPLETED OR UNDERWAY**

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

**Microbial Source-tracking on Onondaga Creek, NY, 5% time spent**  
**Microbial Source-tracking in Cook Inlet, Anchorage, AK, 1% time spent**  
**Distribution of Members of the Vertebrate Microbiome, 5% time spent**  
**Factors Affecting Stream Loading of Antibiotic-Resistant Bacteria, 1% time spent**  
**Identifying Bacterial Indicators of Biosolids, 2% time spent**  
**Identifying Anti-flocculating Bacteria in Wastewater Sludge, 1% time spent**

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

**State Wildlife Competitive Grants Program, US Fish and Wildlife Service. Title: Multistate Recovery Actions For The Bog Turtle And Associated Headwater Wetland Species Of Greatest Conservation Need**

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

**SUNY-ESF Seed Grant Program, Title: Seed Grant Proposal for Monitoring eDNA Markers**

**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

**Jenny Fisher, A. Murat Eren, Hyatt Green, Orin Shanks, Hilary Morrison, Joseph Vineis, Mitchell Sogin, and Sandra McLellan. Comparison of sewage and animal fecal microbiomes using oligotyping reveals potential human fecal indicators in multiple taxonomic groups. *Applied and Environmental Microbiology*. Submitted May 7, 2015**

B. Non-refereed Publications

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

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

**Adaptive Peaks Seminar, Departmental Seminar Series, Oct 23<sup>rd</sup>, 2014, ~60 attended**

## 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.

**Onondaga Lake Watershed Bacterial Trackdown Working Group**

## 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 Society for Microbiology**

3. Other Professional Activities

a. Editorial activity

Journal (s)

Responsibility

Other (books, symposia, etc.)

b. Reviewer

Journal(s)

No. of manuscripts

**Microbial Ecology**

**1**

Agency

No. of proposals

Other

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
<b>GLRC Mentoring Workshop</b>	<b>03/28/15</b>	<b>Onondaga Lake Visitor Center</b>

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

B. College-level

**Poster Judge—Spotlight on Student Research**

C. University-wide, including Research Foundation

**Faculty Committee Member, ESF Technology Committee**

## 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.

**Benefits to Students:** After my first eight months here I am totally amazed and inspired by the dedication and focus of our students who are such a pleasure to work with in and out of the classroom. It’s been about a year since graduate students and I agreed that an intensive introductory R course was lacking on ESF campus. Students had also indicated a lack of quantitative course offerings in general through GPAC surveys. Since then I designed and offered a novel introductory R course (EFB 796) incorporating the latest developments in reproducible research and R programming. Students learn tools that let them not only wield large or complex data sets, but also document all analyses in detail so that they are reproducible—an increasingly important feature in high-profile research. One student wrote that the “**class was excellent and will be among the most useful courses I take as a college student**” and that it “**fills an important niche and I hope you continue to offer it!**” Current efforts are underway to better integrate the course into our existing collection of quantitative offerings taught by Cohen, Friar, Stella, Limburg, etc. After some streamlining, I anticipate the course will exceed 20-25 students in Spring ’16 and will be in high-demand for grads across all departments. As many of my students know, my door is always open to resolve issues or help answer questions and they take me up on it daily. While the R course targeted a clear gap in the course-catalogue, I am excited to finally offer EFB 303: Environmental Microbiology and Lab in Fall ’15, for which 39 students are currently registered. I was also able to participate in Diversity of Life II by giving a lecture on the latest human microbiome research conducted by the Human Microbiome Project consortia and others, which was a great opportunity to illustrate how host-microbe interactions can help us improve environmental health. My first week at ESF I was asked to serve as a M.S. graduate student committee member on a project that seeks to find cost-effective ways of treating wastewater. This student defends Summer ’15, which also marks the start of real work in the Green lab. I recruited an undergraduate student from Brazil to work with Onondaga Environmental Institute to quantify source-specific

molecular markers from Onondaga Lake tributaries, some of which contain remarkably high levels of fecal coliforms in *dry* weather. This study, while small, is intended to help change the way we think about aquatic bacterial contaminants at a basic level with the intent of improving the health of the lake and protecting that of swimmers. Even after having been here for only a few months, two prospective PhD students wanted to work under me starting Fall '15, but neither ended up coming to ESF for reasons out of my control.

**Departmental and University Service:** Currently, I advise six EFB undergraduates, but hope to take on more next year as advising week is probably my favorite part of the term because I get to see students outside my role as instructor. I have also recently joined the ESF Technology Committee. I also enjoyed serving as a judge for graduate student posters during the Spotlight on Student Research Spring '15 and was overwhelmed by the diversity and quality of grad student research on campus.

**Professional Advancement:** Relocating a thousand miles means creating a new professional network locally while maintaining strong ties within the previous network. I am currently familiarizing myself with the players in local water quality issues, such as Atlantic States Legal Foundation, Onondaga Environmental Institute, NY DEC, US EPA Region 2, etc. I recently attended the Great Lakes Research Consortium Mentoring Workshop to gain insights into local funding opportunities. On a parallel track, I'm also seeking collaborators on- and off-campus to investigate the utility of eDNA in assessing species of concern (invasive or endangered). One such species is the endangered bog turtle. Along with a multi-state consortia, I submitted a proposal to the State Wildlife Competitive Grants Program (US FWS) to develop new methods of enumerating these cryptic turtles in their native habitats. I am also working with researchers at UNC-Chapel Hill to develop molecular markers for biosolid wastes. Second author work with UW-Milwaukee researchers entitled "Comparison of sewage and animal fecal microbiomes using oligotyping reveals potential human fecal indicators in multiple taxonomic groups" was just submitted to *Applied and Environmental Microbiology*. Similar work trying to integrate new molecular methods into water quality standards with researchers at the US EPA, UW-Milwaukee, and Wood's Hole is also ongoing. Still after many, many days of clearing out old equipment, chemicals, and glassware and buying new equipment to put in its place, the lab still needs more work to properly support all the work I have planned for it in the near future. While the current lab is not completely ideal for molecular work, I am positive we can generate some good data until new facilities are completed.

#### **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)**

I believe environmental microbiology can play a much larger role on campus and in the region than it has previously—especially with the Environmental Health major picking up speed. I am continually interested in how to design Env. Micro to reflect ESF's unique character, capitalize on our available facilities (e.g., greenhouses, other ESF properties), and regionalize the content (e.g., wine, cheese, water quality). I will raise the cap on the existing R course and make a few changes to schedule/content, but am mostly pleased with how the course went this year. I look forward to offering a split course in Microbial Diversity in Spring '16 as well. Summer '16 I hope to pull together a Field Microbiology course at Cranberry Lake, the shape of which will depend heavily on resources and facilities available at CLBS. I also have dreams of putting together a Food/Fermentation Microbiology course as well. In terms of research, the number of exciting, productive, and feasible projects keeps growing as I talk more with faculty and local professionals. I hope to help continue the success story of Onondaga Lake by contributing directly to a safer, healthier Onondaga Creek. The work will eventually expand to other water bodies of interest, such as Owasco Lake and Lake Ontario, and into areas under drinking water protection, such as the Catskills. Methodological improvements for characterizing environmental microbial communities with next-generation sequencing will soon be developed and have the potential to dramatically change the field of microbial ecology. The Onondaga Lake watershed may also be an excellent location for studying the dissemination of viral particles and antibiotic resistance genes not destroyed by treatment efforts. With recent excitement over recreational swimming in Onondaga Lake, more work needs to be done to ensure that swimmers are not exposed to harmful pathogens.

#### **B. PROJECTED ACTIVITIES FOR NEXT YEAR**

1. Summer 2015

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

**Continue Lab Improvement**

**Microbial Source-Tracking on Onondaga Creek**

- **Sample Collection**
- **DNA Extraction**
- **qPCR**

**Optimization of Methods for Direct Microbial Community Sequencing**

- **Literature Search**
- **E. coli Genome Editing**

**Identifying Anti-flocculating Bacteria in Wastewater Sludge**

- **Culturing**
- **Gene Sequencing**

- c. University, professional society, and public service

2. Fall Semester 2015

- a. Course(s) to be offered

**EFB 303: Environmental Microbiology Lecture & Lab (4 cr, new prep)**

- b. Proposed research activity

**Microbial Source-Tracking on Onondaga Creek**

- **qPCR**
- **Data Analysis**

**eDNA Methods for Bog Turtles (if funded)**

- c. University, Professional society, and public service

**ESF Technology Committee**

3. Spring Semester 2016

- a. Course(s) to be offered

**EFB 796: R & Reproducible Research**

**EFB 505: Microbial Diversity (2 cr, new prep)**

- b. Proposed research activity

**Development of Quantitative Sequencing methods**

**eDNA Methods for Bog Turtles (if funded)**

- **Sample Collection**

- c. University, professional society, and public service

## **ESF Technology Committee**