

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

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

NAME: Christopher M. Whipps

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:

EFB453	Parasitology	3cr	20	1
EFB653	Parasitology	3cr	5	1
EFB797	Population Genetics	1cr	8	0

SPRING:

EFB103	General Biology II: Cell Biology and Genetics	3cr	172	0
EFB797	Host-Pathogen Interactions	1cr	4	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>
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FALL 2015:

BTC298	Rsrch Apprenticeship/Biotech	1	1
BTC298	Rsrch Apprenticeship/Biotech	2	1
BTC420	Internship in Biotechnology	3	2
BTC498	Resrch Prob/Biotechnology	1	1
BTC498	Resrch Prob/Biotechnology	2	1
BTC498	Resrch Prob/Biotechnology	3	1
EFB420	Prof Internship/Envrn Biology	2	1
EFB420	Prof Internship/Envrn Biology	3	3
EFB498	Independent Research/Envrn Bio	2	1
EFB899	Masters Thesis Research	1	1
EFB899	Masters Thesis Research	4	1
EFB899	Masters Thesis Research	6	1
EFB999	Doctoral Thesis Research	9	1

SPRING 2016:

BTC420	Internship in Biotechnology	1	1
BTC420	Internship in Biotechnology	3	1
BTC498	Resrch Prob/Biotechnology	3	2
EFB298	Rsrch Internship/Envrn Biology	1	1
EFB495	Undergrad Exp/Coll Teach	1	3
EFB498	Independent Research/Envrn Bio	3	1
EFB898	Professional Experience	4	1
EFB899	Masters Thesis Research	1	1
EFB999	Doctoral Thesis Research	7	1
ESF499	Honors Thesis/Project	2	1

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

Zebrafish Husbandry Association Webinar Series. July 22, 2015. *Keeping Pathogens out of Your Zebrafish Facility.*

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
EFB217	Peoples, Plagues, and Pests	1
EFB797	Graduate Student Core Course	1
BTC132	Biotech Orientation	1

II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor _27_ and unofficial advisor _8_
- 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

1. Katrina Alger, MS. Start Aug 2013. Completed Nov 2015. Lymphoproliferative disease virus (LPDV) in wild turkeys (*Meleagris gallopavo*) in New York State: Diagnostic methods, prevalence, and spatial distribution of a newly discovered pathogen.
2. Carolyn Chang, PhD sought. Start Jan 2014
3. Cassandra Elliott, MPS sought. Start Jan 2015

CO-MAJOR PROFESSOR

1. Kelly Huffman, MPS. Start Aug 2013. Completed Jun 2016. (co-advise with Dr. John Farrell)
2. Emily Gavard, MS sought. Start Sept 2013 (co-advise with Dr. Sadie Ryan)
3. Samantha Mello, MS sought. Start Aug 2015 (co-advise with Dr. Jonathan Cohen)

MEMBER, STEERING COMMITTEE (other than those listed above)

Completed in Review Period (2)

Lauren Goldmann, PhD complete Summer 2015 (MP Weir)
Christopher Foelker, PhD complete Fall 2015 (MP Fierke)

Ongoing (5)

Geoffrey Eckerlin, PhD candidate (MP Farrell)
Andrew MacDuff, MS sought (MP Frair)
Amanda Cheeseman, PhD sought (MP Cohen)
Tess Youker, MS sought (MP Ryan)
Eric Diefenbacher, PhD sought (MP Gibbs)

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Katherine Lenkiewicz, MS, Spring 2016 (MP Luzadis)

III. RESEARCH COMPLETED OR UNDERWAY

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

Myxozoan parasites of amphibians (boot-legged - 1%)
Parasite fauna of Brazillian and Mexican fishes (boot-legged 2%)
Survey of wild fish parasites in the Great Lakes and Adirondacks (boot-legged 5%)

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)

Kent ML, **Whipps CM**, Dolan B, Tanguay R. NIH Resource Related Research Projects for Development of Animal Models and Related Materials (R24) (07/1/2013 -06/30/2017) \$858,720 (SUNY Subaward \$370,950). Control and Impact of Diseases in Zebrafish. Role: Conduct outbreak investigations, characterize *Mycobacterium* species, assess disinfection and treatment options.

Supports: Carolyn Chang, PhD Student.

Whipps CM, Fierke MK, Parry D. USDA-CREES/McIntire-Stennis Program (05/01/13-09/30/15) - \$52,000. Development of Molecular Techniques to Inform Management of *Sirex noctilio*, an Introduced Woodwasp. (10% AY) Role: Lead development of molecular biology techniques in parasitoid insects.

Supports: Christopher Foelker, PhD Student.

Farrell J, Kapsinski K, **Whipps CM**. NY-DEC (03/31/2013 – 03/31/2016) - \$715,001. St. Lawrence River Fisheries Management and Research. (2% AY) Co-Investigator. Role: Comparative genomics of male and female pike. Development of a sex-specific PCR assay and application to field studies.

Supports: Kelly Huffman, MPS Student.

Cohen J, Ryan S, **Whipps CM**. New York DEC (8/1/12-4/30/2016) \$854,516. Factors Limiting New England Cottontail (*Sylvilagus transitionalis*) Populations in New York: Implications for Habitat Restoration. (5% AY) Role: Genotyping cottontail rabbits.

Supports: Emily Gavard, MS Student & Amanda Cheeseman, PhD student.

Alger KE, **Whipps CM**. New York DEC (6/1/14-4/30/17) \$25,500. Lymphoproliferative Disease Virus (LPDV) in Wild Turkeys (*Meleagris gallopavo*) in New York State, U.S.

Supports: Katrina Alger, MS Student.

Whipps CM. New York DEC (04/01/14-4/30/17) \$132,222. Increasing Capacity for Genetic Analysis at SUNY ESF

Cohen J, **Whipps CM**, Ryan SJ. USDA-CREES/McIntire-Stennis Program (8/15/2015 – 9/30/2017). \$51,042. Assessing Use of Newly-Restored Early Successional Forest by the Imperiled New England Cottontail, Using Genetic Dispersal Analysis.

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

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

Whipps, C.M., Chang, C.T. American Association for Laboratory Animal Science; Grants for Laboratory Animal Sciences (06/15/16-06/14/17). \$29,500. Investigating vector transmission of *Mycobacterium* spp. in laboratory zebrafish through live feeds.

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

Gavard, E.J., **Whipps, C.M.**, Cohen, J., Ryan, S.J. (In Review) Gastrointestinal parasites of the New England cottontail (*Sylvilagus transitionalis*) and eastern cottontail (*Sylvilagus floridanus*) in the Hudson Valley, New York. Journal of Parasitology

Chang, C.T., Amack, J.D., **Whipps, C.M.** (In Press) Zebrafish embryo disinfection with povidone iodine: evaluating an alternative to chlorine bleach. Zebrafish.

Ryan, S.J., Gavard, E.J., Cheeseman, A.M., Cohen, J.B., **Whipps, C.M.** (In Press). Reference and baseline hematocrit measures for the threatened New England cottontail (*Sylvilagus transitionalis*). Journal of Zoo and Wildlife Medicine.

Zhai, Y., **Whipps, C.M.**, Gu, Z., Guo, Q., Wu, Z., Wang, H., Liu, Y. (In Press) Intraspecific morphometric variation in myxosporeans. Folia Parasitol (Praha).

Mason, T., Snell, K., Mittge, E., Melancon, E., Montgomery, R., McFadden, M., Camoriano, J., Kent, M.L., **Whipps, C.M.**, Peirce, J. (In Press) Strategies to mitigate a *Mycobacterium marinum* outbreak in a zebrafish research facility. Zebrafish.

Foelker, C.J., Fierke, M.K., Standley, C.R., Parry, D., **Whipps, C.M.** 2016. Host tissue identification for cryptic hymenopteran parasitoids associated with *Sirex noctilio*. Agricultural and Forest Entomology. 18:91-94

Alger, K.E., Bunting, E., Schuler, K., Jagne, J., **Whipps, C.M.** 2015. Diagnosing Lymphoproliferative Disease Virus in Live Wild Turkeys (*Meleagris gallopavo*) Using Whole Blood. Journal of Zoo and Wildlife Medicine. 46(4):806-814.

Chang, C.T., Colicino, E.G., DiPaola, E.J., Al-Hasnawi, H.J., **Whipps, C.M.** 2015. Evaluating the effectiveness of common disinfectants at preventing the propagation of *Mycobacterium* spp. isolated from zebrafish. Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology. 178:45-50.

Torruella, G. de Mendoza, A., Grau-Bové, X., Chaplin, M. A., del Campo, J., Eme, L., Pérez-Cordón, G. **Whipps, C. M.**, Nichols, K. M., Paley, R., Sitjà-Bobadilla, A., Roger, A. J., Donachie, S., Ruiz-Trillo, I. 2015. Phylogenomics reveals convergent evolution of lifestyles in close relatives of animals and fungi. *Current Biology*. 25(18):2404-2410.

Nogueira, C.L., **Whipps, C.M.**, Matsumoto, C.K., Chimara, E., de Freitas, D., Sampaio, J.L., Cnockaert, M., Palomino, J.C., Martin, A., Vandamme, P., Leão, S.C. (2015). Description of *Mycobacterium saopaulense* sp. nov., a rapidly growing mycobacteria closely related with members of the *Mycobacterium chelonae-M. abscessus* group. *International Journal of Systematic and Evolutionary Microbiology*. 65:4403-4409

Whipps, C. M., Zhao, Y. 2015. Synopsis of the species of the genus *Sphaeromyxa* Thélohan, 1892 (Myxosporaea: Bivalvulida: Variisporina: Sphaeromyxidae). *Systematic Parasitology*. 92(2):81-99

Bauer, E.F., **Whipps, C.M.** 2015. The bass parasites of Oneida Lake, eighty years later. *Journal of Parasitology*. 101(5):505-513.

Chang, C.T., **Whipps, C.M.** 2015. Activity of antibiotics against *Mycobacterium* species commonly found in laboratory zebrafish. *Journal of Aquatic Animal Health*. 27(2):88-95.

Helenbrook, W.D., Shields, W.M., **Whipps, C.M.** 2015. Characterization of *Blastocystis* species infection in humans and mantled howler monkeys, *Alouatta palliata aequatorialis*, living in close proximity to one another. *Parasitology Research*. 114(7):2517-2525

Helenbrook, W.D., Wade, S.E., Shields, W.M., Stehman, S.V., **Whipps, C.M.** 2015. Gastrointestinal parasites of Ecuadorian mantled howler monkey (*Alouatta palliata aequatorialis*) based on fecal analysis. *Journal of Parasitology*. 101(3):341-350.

B. Non-refereed Publications

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

July 13 – 15, 2015. Annual Meeting of the Fish Health Section of the American Fisheries Society. Ithaca, NY. *Strain Typing Mycobacterium marinum from outbreaks at zebrafish research facilities*. Clemons, B.M., Chang, C.T., **C.M. Whipps**.

- Student and other co-authored presentations (presenter underlined)

April 19, 2016. SUNY-ESF Spotlight on Student Research, Syracuse, NY. *Antibiotic treatment of zebrafish mycobacteriosis: efficacy of treatment with tigecycline and clarithromycin*. Chang, C.T., Doerr, K.M., **Whipps, C.M.**

April 19, 2016. SUNY-ESF Spotlight on Student Research, Syracuse, NY. *A Genomic Analysis for Markhor (Capra falconeri heptneri): Enhancing Captive Breeding Standards for Species Survival Plans*. Elliott, C.B., Huie, J.L., Greenberg, A.J., LaBarge, T., **Whipps, C.M.**

April 19, 2016. SUNY-ESF Spotlight on Student Research, Syracuse, NY. *Evaluating Accuracy of Field Identification of Predator Scat through DNA amplification of the cytochrome b gene*. Williamson, J., Michaud, C., Frair, J.L., **Whipps, C.M.**

April 19, 2016. SUNY-ESF Spotlight on Student Research, Syracuse, NY. *Investigating tolerance, growth, and fecundity of laboratory zebrafish (Danio rerio) treated with clarithromycin and tigecycline antibiotics*. Doerr, K.M., Chang, C.T., **Whipps, C.M.**

April 19, 2016. SUNY-ESF Spotlight on Student Research, Syracuse, NY. Investigating transmission of Mycobacterium spp. from experimentally infected zebrafish (*Danio rerio*) to tank biofilms. Adler, A., Chang, C.T., **Whipps, C.M.**

February 22-26, 2016. Aquaculture 2016. Zebrafish embryo disinfection with povidine iodine: Evaluating an alternative to chlorine bleach. Chang, C.T., **Whipps, C.M.**

October 17-21, 2015. The Wildlife Society 22nd Annual Conference. Winnipeg, Manitoba, Canada. *Epidemiology and Genetic Analysis of Lymphoproliferative Disease Virus (LPDV) in New York State.* Alger K., Bunting E, Schuler K, **Whipps C.M.**

September 27-October 1, 2015. 42nd Annual American Association of Zoo Keepers National Conference. *Ex-Situ Conservation of Capra falconeri heptneri: A Genomic Analysis to Enhance Captive Breeding Standards.* Elliott, C.B., Huie, J.L., Greenberg, A.J., LaBarge, T., **Whipps, C.M.**

July 26 – 30, 2015. Symposium: International and Collaborative Approaches to Lagomorph Conservation in a Changing World. Vth International Wildlife Management Congress 2015. *The influence of invasive species on habitat use and dispersal of the New England cottontail, an imperiled endemic lagomorph in a human-dominated landscape.* Cheeseman, A., Cohen, J., **Whipps, C.M.**, Ryan S.J.

July 26 – 30, 2015. Symposium: International and Collaborative Approaches to Lagomorph Conservation in a Changing World. Vth International Wildlife Management Congress 2015. *The Effect of an Introduced Competitor and Non-Native Forage Plants on Parasites and Body Condition of the New England Cottontail in Fragmented Habitat.* Ryan, S.J., Gavard, E., Cohen, J., Cheeseman, A., **Whipps, C.M.**

July 13 – 15, 2015. Annual Meeting of the Fish Health Section of the American Fisheries Society. Ithaca, NY. *Toxicity of iodine to zebrafish (*Danio rerio*) embryos, an alternative to chlorine disinfection for preventing mycobacterial spread.* Chang, C.T., Amack, J.D., **Whipps, C.M.** (Best student presentation award)

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

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.

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)

Organizing committee for the Annual Meeting of the Fish Health Section of the American Fisheries Society. Ithaca, NY. July 13 – 15, 2015.

2. Professional Society Membership

American Fisheries Society
 American Society of Microbiology
 American Society of Parasitologists
 American Association for Laboratory Animal Science

3. Other Professional Activities

a. Editorial activity

<u>Journal (s)</u>	<u>Responsibility</u>
Journal of Parasitology	Associate Editor (5 articles Nov 19/15-May 31/16)

Other (books, symposia, etc.)

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
AFS Books	1
Diseases of Aquatic Organisms	1
International Journal for Parasitology	1
Journal of Fish Diseases	3
Journal of the American Association for Laboratory Animal Sci.	1
Northwestern Naturalist	1
Parasitology	2
Parasitology International	1
Parasitology Research	2
Systematic Parasitology	1
<u>Zebrafish</u>	<u>2</u>
Total = 16	

<u>Agency</u>	<u>No. of proposals</u>
Binational Science Foundation	1

Other

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.

Case Study Teaching in Science. National Center for Case Study Teaching in Science. 16th Annual Conference September 18-19, 2015.

D. Foreign Travel (Where, When, Purpose)

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

EFB Curriculum Committee (Jan-Feb 2008, Aug 2008-present). Chair: Kim Schulz.

EFB Disease Ecology/Epidemiology Search Committee (Oct2015-Apr2016). **Chair: Christopher Whipps**

B. College-level

ESF Institutional Animal Care and Use Committee (Aug 2011-present). **Chair: Christopher Whipps**

ESF Honors Program Faculty Council (Aug 2011-present). Director: William Shields.

ESC Health and the Environment Curriculum Group Participant (Mar 2011-present)

ESF Academic Research Building Core Team (Apr 2010-present)

C. University-wide, including Research Foundation

SUNY Center for Applied Microbiology (Feb 2013 – present) Director

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 my EFB103 General Biology class (of 172 students), I introduced two new teaching methods to increase engagement; 1) case studies, and 2) classroom response system. Cases are set up as narratives, where we learn about the story while delving more deeply into certain topics. They may be a mystery to solve or have a twist at the end. Students worked in groups and there was discussion around certain questions. Based on teaching reviews, these were well received. In conjunction with cases, I used a classroom response system (clickers) daily, and this was also well received. It allowed me to gauge student understanding on the spot, which can otherwise be difficult in a large class. For EFB453/653 Parasitology, I have always used brief case studies, requiring diagnoses of parasitic infections from the CDC, but I've also started using and developing my own narrative cases for this class. I taught a Fall seminar class EFB797 Population Genetics, and diverged from the journal club style format I often use for seminars. Instead, I incorporated lectures and assignments in the first part of the course, interspersed with discussions on papers. Then, I asked the students to present on a topic and develop their own in-depth assignments that would walk a student through an analysis in detail. Having to work through a paper in this detail added depth to the student's engagement and learning.

For 5 months this past year, I welcomed a graduate student from Brazil, Leticia Vidal, to work in my laboratory. This was a mutually good experience. She was trained on molecular biology work which will contribute to her thesis, and from this will stem several manuscripts. In November, my Master's student Katrina Alger successfully defended her thesis and is currently applying her newly developed skills in a very fitting position at the National Wildlife Health Center. Katrina already published a paper from her thesis, and has 2 more in the works. Another student, Kelly Huffman, completed her MPS. My PhD student Carolyn Chang published 3 papers, and was the recipient of the best student presentation award at the 2015 AFS Fish Health Meeting. In addition to graduate student mentoring, I had several undergraduate researchers (Ashley Adler, Kristen Doerr, Ilana Weinstein) and an honors

student (Julia Williamson) working on projects. I advise >20 undergraduate students, many of which are pre-health, and from several majors (Biotech, Environmental Biology, Conservation Biology, Wildlife Biology). I help organize internships, research courses, and apprenticeships.

Department/College

For EFB I serve on the departmental curriculum committee, where we contributed heavily to the departmental assessment of majors. I chaired the Disease Ecology/Epidemiology search this Spring. Chairing the search was an extremely demanding but rewarding experience, leading to the successful hire of Brian Leydet. At the college level, I chair the Institutional Animal Care and Use Committee (IACUC) which is currently overseeing 34 protocols on various vertebrate species (snakes, frogs, salamanders, birds, fish, moose, etc.). The work requires a great amount of attention, with regular monitoring of existing work in addition to processing new protocols as they come in. This year, ESF is also seeking Animal Assurance overseen by the Office of Laboratory Animal Welfare. This was necessary due to a new policy that requires NSF and NIH work involving vertebrate animals to have this Assurance, as well as existing work at ESF requiring it. I have written detailed protocols for ESF's animal program, and the Assurance is currently being reviewed. At the SUNY level, I direct the Center for Applied Microbiology, which supports research on microbes (*sensu lato*), student travel, and equipment purchase.

Self

I was very pleased to be invited to serve as an Associate Editor for the Journal of Parasitology (JP). This is one of the most respected journals in the field with a rich history. Former ESF faculty Justus Mueller, well known for his books on Parasites of Oneida Lake Fishes in the Roosevelt Wildlife Annals (amongst many other accomplishments), was once the Editor of JP. I am glad to be a part of this connection in my own way. I served on the organizing committee for the AFS Annual Fish Health meeting this past summer in Ithaca, and the meeting was a success and I enjoyed being part of it. It was definitely a big job, but I learned a lot from the experience. I had several papers come out this year from ongoing collaborations and from student's work. I always enjoy seeing a study published, particularly the works that came from undergrad and graduate research. In September, I attended a Conference on teaching with Case Studies in Buffalo. I'd recommend this to anyone thinking about using case-based learning in the classroom. Sessions covered how to integrate cases, how to write cases, tips on how to make them work well, how to use in large classes vs. small, etc. We also worked through a few different kinds of cases in groups to see how these work first hand. I was inspired to use cases more extensively in my classes, and had a great time using them in EFB103 this 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 research, I plan to drive to completion a complete set of genetic data on cottontail rabbits. The Northern Pike research with John Farrell will require careful histological analysis from me, and we will continue to collaborate with researchers at the University of Victoria on the genetics of pike. I plan to complete a genetic analysis of parasites of amphibians in the southeast. Working with an honors student and Melissa Fierke, I hope to complete the genetic work on parasitoid insects. My zebrafish disease research will come up for renewal this year, so significant time will be dedicated to writing that grant renewal and publishing on the existing work we are doing. For service, I will continue as chair of the IACUC, which has become more demanding. My goal is to focus primarily on this as my main service component. For teaching, I believe I've hit on something good with the case studies and clickers in my large class. I'll continue to refine these applications and strive to make the classes better than they already are. One thing I will try is adding some online modules for parts of my main classes, where I will create short video/drawing recordings (in the style of Khan Academy) that cover a particular topic. I think this may be particularly useful in Parasitology where there are fewer of these kinds of resources.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2016

a. Course(s) to be offered

b. Proposed research activity

Cottontail genetic identification and parasite analysis

Zebrafish mycobacteriosis

Molecular diagnostics of parasites

Myxozoan phylogeny and evolution

Baseline data on fish diseases in NY state

Northern Pike genomics

Sirex noctilio molecular biology

Genetics of deer and other species for DEC

c. University, professional society, and public service

EFB Curriculum Committee (Jan-Feb 2008, Aug 2008-present). Chair: Kim Schulz.

ESF Institutional Animal Care and Use Committee (Aug 2011-present). **Chair: Christopher Whipps**

ESF Honors Program Faculty Council (Aug 2011-present). Chair: William Shields.

ESC Health and the Environment Curriculum Group Participant (Mar 2011-present)

SUNY Center for Applied Microbiology (Feb 2013 – present) **Director**

2. Fall Semester 2016

a. Course(s) to be offered

EFB453/653 Parasitology

b. Proposed research activity

as above

c. University, Professional society, and public service

as above

3. Spring Semester 2017

a. Course(s) to be offered

EFB103 - General Biology II

b. Proposed research activity

as above

c. University, professional society, and public service

as above