

ANNUAL REPORT: June 1, 2012 – May 31, 2013
(i.e., Summer 2011, AY 2011-2012)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: J Scott Turner

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

	<i>Course number</i>	<i>Title</i>	<i>Credhrs</i>	<i>No of students</i>	<i>No of lab sect</i>
SUMMER:					
FALL:	EFB 200	<i>Physics of Life</i>	3	132	
	EFB 462	<i>Animal Physiology: Environmental & Ecological</i>	3	64	-
	EFB 662	<i>Animal Physiology: Environmental & Ecological</i>	3	2	-
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. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

None

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

	<i>Course number</i>	<i>Title</i>	<i>Credhrs</i>	<i>No of students</i>	<i>No of lab sect</i>
SUMMER					
FALL	EFB 420	<i>Internship</i>	7	1	
SPRING:	EFB 420	<i>Internship</i>	3	1	

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

None

4. Guest Lecture Activities

Two lectures in Diversity of Life
One lecture in Principles of Evolution

II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student’s official advisor 18 and unofficial advisor I have no idea what this means.

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

CO-MAJOR PROFESSOR

MEMBER, STEERING COMMITTEE (other than those listed above)

Name	<i>Degree sought</i>	<i>Starting date (Mo & Yr)</i>	<i>Degree completed?</i>	<i>Thesis or dissertation citation</i>
Lauren Goldmann	PhD	Aug 2010	No	N/A

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Name	<i>Degree sought</i>	<i>Starting date (Mo & Yr)</i>	<i>Degree completed?</i>	<i>Thesis or dissertation citation</i>
Chen Gong	PhD	Oct 2012	Yes	N/A
Scott Gates	PhD	N/A	No	N/A

III. RESEARCH COMPLETED OR UNDERWAY

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

None

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)

Source	Title	Amount	Current year	Award period	Graduate Assistants supported
Human Frontiers Science Program	<i>From swarm intelligence to living buildings. Novel concepts of managing internal climates</i>	\$1,350,000	0	August 2012 to July 2015	1
Jacob Blaustein Center for Scientific Cooperation (Ben Gurion University of the Negev)	<i>Visiting Foreign Scientist</i>	\$5,000	1	1 December 2012 to 31 December 2012	0

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

Source	Title	Amount	Award period	Graduate Assistants supported
Israel/US Binational Science Foundation	<i>New concepts of mass exchange in animal burrow systems</i>	\$650,000	September 2013 to August 2016	2
New York State Energy Research Development Authority (NYSERDA)	<i>Proof of concept: A termite-inspired "humidity sponge."</i>	\$50,000	September 2013 to August 2014	0

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

N/A

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

- Turner, J S.** 2013. Superorganisms and superindividuality. The emergence of individuality in a social insect assemblage. In: Frédéric Bouchard and Philippe Huneman (eds). *From Groups to Individuals. Perspectives on Biological Associations and Emerging Individuality*. The Vienna Series in Theoretical Biology. MIT Press.
- Turner, J S.** 2013. Biology's second law. Homeostasis, purpose and desire. In: B. G. Henning and A. Scarfe. (eds). *Beyond Mechanism. Putting Life Back into Biology*. Lexington Books/Rowman & Littlefield.
- Odling-Smee, J and J S Turner.** 2013. Niche construction theory and human architecture. *Biological Theory*.
- Turner, J S.** In press. The semiotics of a superorganism. In: K. Kull and J. Hoffmeyer (eds) *Approaches to Semiosis of Evolution*. Heidelberg, Springer.
- Turner, J S.** In press. Homeostasis and the forgotten vitalist roots of adaptation. In: C. T. Wolfe and S. Normandin (eds) *Vitalism and the Scientific Image*. C. Heidelberg, Springer.

B. Non-refereed Publications

Media

	Title/Description		
C Baycura. 2013.	<i>Conversations with Scott Turner</i> Addy Pross. <i>Addy Pross is Professor of Chemistry at Ben Gurion University in Israel. He is a leading figure in Origin-of-Life research</i>	http://youtu.be/5YVHQWTFAYE	
J S Turner. 2013	<i>Social insects 1. Introduction to the social insects</i> <i>For Diversity of Life</i> <i>Social insects 2. Kin selection and the evolution of sociality in insects.</i> <i>For Diversity of Life</i> <i>Social insects 3. The superorganism</i> <i>For Diversity of Life</i>		https://ensemble.syr.edu/app/sites/index.aspx?destinationID=3PSBldVG8UyqgNXD-1afNw
C Baycura. 2012.	<i>Conversations with Scott Turner</i> Bruce Brewer. <i>Bruce Brewer is Managing Director of the Cheetah Conservation Fund in Namibia. He talks here about their innovative work integrating biofuels and range management.</i>	http://youtu.be/bczEfUI2im8	
C Baycura. 2012	<i>Conversations with Scott Turner</i> Laurie Marker. <i>Laurie Marker is the Founder and Director of the Cheetah Conservation Fund in Namibia. She talk here about cheetah conservation and the challenges of working in a developing country like Namibia.</i>	http://youtu.be/ozQwdiK-UHw	
J S Turner. 2012	<i>Optimum walking speed.</i> <i>For Physics of Life. How fast should animals walk? Shot on location in Namibia.</i>	http://youtu.be/IR2ryf9Bz4A	

JS Turner. In
production

Animal physiology on line
Ongoing production of video material for the
expected launch of *Animal Physiology Online*. 48
videos to date.

<https://ensemble.syr.edu/app/sites/index.aspx?destinationID=MU-bxn0C5ECxjFSbAccsKA>

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

There's lots of room in the transients. Why the unsteady state is the key to understanding life and how to successfully imitate life. 8 June 2012. 3rd International Wyss Institute Symposium. Noise and Rhythm. Harnessing Complexity in Medicine and Robotics. Wyss Institute, Harvard University.

Termite-inspired design? 20 September 2012. NYSERDA Sustainability Conference. COESS, Syracuse, New York.

How, precisely, should we be inspired by living nature? 9 November 2012. Vienna Biocentre PhD Symposium. Vienna, Austria. Keynote speaker.

Swarm intelligence and swarm cognition in mound-building termites. 11 November 2012. Symposium on Social Insects and the Emergence of Novelty. From Local Rules to Global Behavior. Entomological Society of America Annual Meeting. Knoxville, Tennessee.

How, precisely, should we be inspired by living nature? 11 December 2012. AmeriMech 2012. Conference on Biologically-Inspired Design. Virginia Tech, Blacksburg, Virginia.

Is there a "problem of biological design?" 8 March 2013. SIDEER Symposium 2013. The Emergence of Design in Nature. Ben Gurion University of the Negev. Featured speaker.

Dynamic form and function and the nature of adaptation in the extended organism. 8 March 2013. SIDEER Symposium 2013. The Emergence of Design in Nature. Ben Gurion University of the Negev. Featured speaker.

Homeostasis as "Biology's Second Law." 9 March 2013. SIDEER Symposium 2013. The Emergence of Design in Nature. Ben Gurion University of the Negev. Workshop leader.

How evolutionary biology got stuck in a mechanistic muddle. Is modern Darwinism really Darwinism? 9 March 2013. SIDEER Symposium 2013. The Emergence of Design in Nature. Ben Gurion University of the Negev. Featured speaker.

Design in biology and human evolution. How to think about it like biologists. 10 March 2013. SIDEER Symposium 2013. The Emergence of Design in Nature. Ben Gurion University of the Negev. Workshop leader.

Novel concepts in biologically-inspired climate management. 29 April 2013. Yahoo! Workshop. Exploring Innovation in Data Centers through Biomimicry. Lockport, New York.

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

- b. 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

- b. Other Professional Activities

- b. Editorial activity

Journal(s)

Bio-Complexity

Intelligent Buildings International

Responsibility

Editorial board

Guest editor to special issue on biomimetic architecture

Other (books, symposia, etc.)

- b. Reviewer

<i>Journal(s)</i>	<i>No of manuscripts</i>
<i>Journal of Experimental Zoology</i>	2
<i>Journal of Thermal Biology</i>	1
<i>Quarterly Review of Biology</i>	1
<i>Foundations of Science</i>	1
<i>Journal of Insect Science</i>	1
<i>Public Library of Science (PLoS)</i>	1
<i>Journal of Apicultural Science</i>	1
<i>Books</i>	<i>No of manuscripts</i>
<i>Harper-Collins</i>	1

Other

- c. Participation (workshops, symposia, etc.)

Name of workshop, etc.

Date

Place

SIDEER Symposium 2013. The Emergence of Design in Nature.

Ben Gurion University of the Negev. 8-10 March 2013

Yahoo! Workshop. Exploring Innovation in Data Centers through Biomimicry.

Lockport, New York. 29 April 2013

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

- D. Foreign Travel (Where, When, Purpose)

Vienna, Austria. November 2012. Keynote Speaker at Vienna Biocentre PhD Symposium
Israel. March 2012. Featured speaker at SIDEER PhD Symposium.
Namibia. May-June 2012. Field research

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

B. College-level

Ad Hoc Technology Committee.

C. University-wide, including Research Foundation

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.

- 1 EFB 200 Physics of Life was offered for the fourth time. Its enrollment continues to be strong.
- 2 EFB 462 was offered again, with continued healthy enrollment.
- 3 I have begun production for the planned rollout of Animal Physiology Online, which will be launched in Fall 2014. To date, 48 videos have been produced. Production will continue for the next 18 months.
- 4 Work began on my research project funded by the Human Frontiers Science Program (HFSP), for which I am the Principal Investigator. We have hired a post-doctoral fellow (Dr Paul Bardunias) for my portion of this multi-investigator project (which includes as co-PIs L Mahadevan (Harvard), Rupert Soar (Trent-Nottingham), Eugene Marais (National Museum of Namibia) and Sanjay Sane (National Centre for Biological Sciences, Bangalore, India). This grant will expand upon my previous work on termite mounds to include work on advanced fluid mechanics, neurobiology of termite swarms, species diversity of termite-built structures, and application to novel methods of wind-driven control of built environments.
- 5 Several invited papers, relevant to my current book project, have now been published.
- 6 I continue production on a new series of video lectures to supplement my current book project. Four videos in this series (entitled *Biology's Second Law*) have been completed. Links to these videos are listed in "Unrefereed publications."
- 7 I hosted three interesting speakers to campus this year: Bruce Brewer, who is managing director of the Cheetah Conservation Fund, who spoke about biofuels and range management, Laurie Marker, who is founder and director of the CCF, who spoke about cheetah conservation, and Addy Pross, Professor of Chemistry at Ben Gurion University in Israel, who spoke about emergence of life.
- 8 I negotiated a Memorandum of Understanding between ESF, Ben Gurion University, the National Museum of Namibia and the Cheetah Conservation Fund in Namibia to begin development of joint educational/training/research projects. Margaret Bryant, of ESF's Department of Landscape Architecture, will travel to Namibia in October to begin the first of our ventures.

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)

- 1 This year will be the last regular offering of EFB 462 Animal Physiology. I intend to launch Animal Physiology as an online course, beginning in Fall 2014. Production for this series is ongoing.
- 2 I have volunteered to serve as the first chair of the newly established Standing Committee on Technology. My hope is to begin moving ESF toward a stronger presence in online education.
- 3 I will continue to work to establish an international campus in Namibia. We have established the Cheetah Conservation Fund facility in Namibia as the best venue for this project. I have been in discussion with several colleagues at ESF to participate in this program. Margaret Bryant in Landscape Architecture will travel to Namibia in October 2013 to establish the first of these cooperative projects.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2011
 - a. Course(s) to be offered
None
 - b. Proposed research activity
Continue HFSP project
Complete book manuscript
 - c. University, professional society, and public service
Standing Committee on Technology
2. Fall Semester 2011
 - a. Course(s) to be offered
EFB 200 Physics of Life
EFB 462/662 Animal Physiology
 - b. Proposed research activity
Initiate research in India
Continue HFSP project
 - c. University, Professional society, and public service
Standing Committee on Technology
3. Spring Semester 2012
 - a. Course(s) to be offered
none currently planned
 - b. Proposed research activity
Research expedition(s?) to Namibia, India, Israel.
 - c. University, professional society, and public service
1. Summer 2012
 - a. Course(s) to be offered
 - b. Proposed research activity
Research expedition(s?) to Namibia, India, Israel.
 - c. University, professional society, and public service
Standing Committee on Technology