

# Kaitlin M. Baudier, PhD

Postdoctoral Research Associate  
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## Research Interests

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Comparative physiological ecology  
Behavioral ecology of social insects  
Climate change in tropical ecosystems

## Education

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- 2017 **Doctor of Philosophy - Biological Sciences**  
Drexel University, Philadelphia, PA  
*Dissertation: Microhabitat and elevational patterns in thermal tolerance and thermoregulation of Neotropical army ants (Formicidae: Dorylinae)*
- 2008 **Bachelor of Science, cum laude - Biological Sciences**  
Louisiana State University, Baton Rouge, LA

## Academic Positions

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- 2017-present **Postdoctoral Research Associate**, Social Insect Research Group, School of Life Sciences, Arizona State University, Tempe, AZ  
Advisors: Jennifer Fewell, Ted Pavlic, Stephen Pratt  
Funding: *US Air Force/Eglin AFB/FL A8651-17-F-1013; DARPA W31P4Q-18-C-0054*
- 2012-2017 **PhD Student/Candidate**, Department of Biodiversity, Earth & Environmental Sciences, Drexel University, Philadelphia, PA, Advisor: Sean O'Donnell  
Extramural Funding: *NSF 1209072, OTS Tyson Research Fellowship*
- 2010-2012 **Entomologist**, Department of Entomology, Audubon Insectarium, Audubon Nature Institute, New Orleans, LA
- 2009 **Research Associate**, Department of Entomology, Louisiana State University, Baton Rouge, LA, Advisor: Linda Hooper-Bùi
- 2006-2008 **Undergraduate Researcher**, Department of Entomology, Louisiana State University, Baton Rouge, LA, Advisor: Linda Hooper-Bùi

## Professional Affiliations

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Animal Behavior Society  
International Union for the Study of Social Insects  
Association for Tropical Biology and Conservation  
Entomological Society of America

## Honors & Awards

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- 2017 Organization for Tropical Studies, Outstanding student paper - honorable mention  
2016 XXV International Congress of Entomology, 2nd place grad student oral presentation  
2015 Drexel Research Day, 1st place poster in Biology & Biomedical research  
2013 & 2015 Drexel University Teaching Excellence Award Nominee  
2013 Drexel Students Tackling Advanced Research (STAR) Outstanding Mentor Award  
2012-2014 Drexel College of Arts & Sciences Dean's Fellowship

## Additional Training

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- 2019-2020 Weaving the Future of Animal Behavior Workshops, Animal Behavior Society  
2009 Neotropical Social Insects Course, Organization for Tropical Studies, Costa Rica

Google scholar metrics: citations = 200, h-index = 7, i10-index = 5

## Peer-reviewed

- 17 **Baudier KM**, Pavlic TP. (2020) Incidental interactions among Neotropical army-ant colonies are met with self-organized walls of ants (Hymenoptera: Formicidae). *Myrmecological News*. In press.
- 16\* **Baudier KM**§, Bennett MM§, Ostwald MM, Hart S, Pavlic TP, Fewell JH (2020) Age-based changes in kairomone response mediate task partitioning in stingless bee soldiers (*Tetragonisca angustula*). *Behavioral Ecology and Sociobiology*. 74:125. DOI:10.1007/s00265-020-02902-4
- 15\* Welch L, **Baudier KM**, Harrison J (2020) Warmer mid-day temperatures increase leaf intake by increasing forager speed and success in *Atta colombica* during the rainy season. *Insectes Sociaux*. 67:213–219. DOI:10.1007/s00040-020-00749-6
- 14 **Baudier KM**, O'Donnell S. (2020). Rain shadow effects predict population differences in thermal tolerance of leaf-cutting ant workers (*Atta cephalotes*). *Biotropica*, 52(1):113-119. DOI:10.1111/btp.12733
- 12\* **Baudier KM**, Ostwald MM, Grüter C, Segers FH, Roubik DW, Pavlic TP, Pratt SC, Fewell JH (2019). Changing of the guard: mixed specialization and flexibility in nest defense (*Tetragonisca angustula*). *Behavioral Ecology*, 30(4):1041-1049. DOI:10.1093/beheco/arz047
- 11\* **Baudier KM**, D'Amelio CL, Sulger E, O'Connor MP O'Donnell S (2019) Plastic collective endothermy in a complex animal society (army ant bivouacs: *Eciton burchellii parvispinum*). *Ecography*. 42(4):730-739. DOI:10.1111/ecog.04064
- 10 Strickland LG, **Baudier KM**, Bowers KP, Pavlic TP, Pippin CP (2019) Bio-inspired role allocation of heterogeneous teams in a site defense task, *Distributed Autonomous Robotic Systems*, 9:139-151. DOI:10.1007/978-3-030-05816-6\_10
- 9 **Baudier KM**, S O'Donnell (2018). Complex body size differences in thermal tolerance among army ant workers (*Eciton burchellii parvispinum*). *Journal of Thermal Biology*, 78:277–280. DOI:10.1016/j.jtherbio.2018.10.011
- 8\* Ostwald MM, Ruzi SA, **Baudier KM** (2018) Ambush predation of stingless bees (*Tetragonisca angustula*) by the solitary-foraging ant *Ectatomma tuberculatum*. *Journal of Insect Behavior*, 31(5):503–509. DOI:10.1007/s10905-018-9694-9
- 7\* **Baudier KM**, D'Amelio CL, Malhotra R, O'Connor MP, O'Donnell S (2018) Extreme insolation: climatic variation shapes the evolution of thermal tolerance at multiple scales. *The American Naturalist*, 192(3):347–359. DOI:10.1086/698656
- 6 O'Donnell S, **Baudier KM**, Fioca K, Marena DR (2018) Erythritol ingestion impairs adult reproduction and causes larval mortality in *Drosophila melanogaster* fruit flies (Diptera: Drosophilidae). *Journal of applied entomology*, 142(1–2):37–42. DOI:10.1111/jen.12409
- 5† **Baudier KM**, O'Donnell S (2017) Weak links: How colonies counter the social costs of individual variation in thermal physiology. *Current Opinion in Insect Science*, 22:85-91. DOI:10.1016/j.cois.2017.06.004
- 4 **Baudier KM**, O'Donnell S (2016) Structure and thermal biology of subterranean army ant bivouacs in a tropical montane forest. *Insectes Sociaux*, 63(3):467–476. DOI:10.1007/s00040-016-0490-2
- 3 O'Donnell S, **Baudier KM**, Marena DR (2016) Non-nutritive polyol sweeteners differ in insecticidal activity when ingested by adult *Drosophila melanogaster*. *Journal of Insect Science*, 16(1):1-3. DOI:10.1093/jisesa/iew031
- 2\*‡ **Baudier KM**, Mudd AE, Erickson SC, O'Donnell S (2015) Microhabitat and body size effects on heat tolerance: implications for responses to climate change (army ants: Formicidae, Ecitoninae). *Journal of Animal Ecology*, 84(5):1322–1330. DOI:10.1111/1365-2656.12388

- 1\* **Baudier KM**, Kaschock-Marenda SD, Patel N, Diangelus KL, O'Donnell S, Marenda DR (2014) Erythritol, a non-nutritive sugar alcohol sweetener and the main component of Truvia®, is a palatable ingested insecticide. *PLoS ONE*, 9(6):e98949. DOI:10.1371/journal.pone.0098949

### Book Chapters

- 13† **Baudier KM** (2019). Brood Stimulation Hypothesis. In *Encyclopedia of Social Insects*, ed. Starr CK. Cham, Switzerland: Springer International. DOI:10.1007/978-3-319-90306-4\_16-1

### Submitted Manuscripts

- 18\* **Baudier KM**<sup>§</sup>, Ostwald MM<sup>§</sup>, Calixto JM, Cossio FJ, Fewell JH. (*In Review*). Social factors in heat survival: Multi-queen desert ant colonies have higher and more uniform heat tolerance. *The American Naturalist*.
- 19\* Prendergast CT\*, Harrison JF, **Baudier KM** (*Submitted*) Variation in reflective flow and forager navigation explain speed of obstruction circumnavigation on *Atta colombica* foraging trails.
- 20† Bennett MM, **Baudier KM** (*Submitted*) The night shift: Nest closure and guarding behaviors in the stingless bee, *Tetragonisca angustula*

### Manuscripts in Preparation

- 21\* **Baudier KM**, Wu R, Bennett MM, Ostwald MM, Fewell JH, Harrison JF. (*In prep*) Metabolic dynamics of morphologically distinct stingless bee soldiers and their age differentiated task groups (*Tetragonisca angustula*)
- 22\* **Baudier KM**, Bennett MM, Barrett M, Cossio F, Wu R, O'Donnell S, Fewell JH (*In prep*) Modality-specific neural investment in soldiers of the stingless bee *Tetragonisca angustula*
- 23\* **Baudier KM**, Zoppas de Albuquerque E, Calixto JM (*In prep*) One ant's dump is another ant's dinner: Neotropical army ant middens are transient resources for a diverse assemblage of ants.
- 24 **Baudier KM**, O'Donnell S. (*In prep*) Tradeoffs between reducing thermal range and raising thermal mean in high elevation bivouacs of *Eciton burchellii parvispinum*
- 25 **Baudier KM**, Austero M, Schauer C, O'Donnell S (*In prep*) Evolution of sticky tubercles in subfamily Ponerinae.

### Research Support

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#### PI or Co-PI

- 2018-2019 **Innovative Post-Doctoral Research Award – Co-PI**  
*Modalities of task specialization in the stingless bee Tetragonisca angustula*  
School of Life Sciences, Arizona State University, Tempe, AZ
- 2016-2017 **Claudio Elia Environmental Science & Engineering Fellowship – PI**  
*Using ants to model thermal physiology along tropical temperature gradients*  
Drexel University, Philadelphia, PA
- 2016 **McLean Fellowship for Environmental Science & Ornithology – PI**  
*Multilevel thermal adaptation in Neotropical army ants*  
Academy of Natural Sciences, Philadelphia, PA
- 2014 **Christiane and Christopher Tyson Research Fellowship – PI**  
*Ecological and physiological factors in Neotropical army ant thermal tolerance*  
Organization for Tropical Studies, San Jose, Costa Rica

#### Key/Senior Personnel

- 2018-2021 **DARPA W31P4Q-18-C-0054 (Phase I & II)**  
*Autonomous System Control via Social Insect Models (ASC-SIM)*  
United States Defense Advanced Research Projects Agency, Arlington, VA
- 2017-2018 **US Air Force/Eglin AFB/FL A8651-17-F-1013**  
*Bio-Inspired Swarming (BioSwarm) Seedling project*  
United States Defense Advanced Research Projects Agency, Arlington, VA

2015-2016 **Eppley Award**  
*Erythritol sweetener as insecticide*  
The Eppley Foundation for Research, New York, NY

#### Received Travel awards

2019 Weaving the Future of Animal Behavior (WFAB) Travel Award  
2018 International Union for the Study of Social Insects NAS Travel Award  
2013-2016 Drexel University Graduate Student Travel Awards  
2007 Louisiana State University Study Abroad Award

#### Teaching experience

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##### Co-Instructor

2018 **Tropical Biology (Study Abroad - Panama), BIO 494**  
School of Life Sciences, Arizona State University

##### Guest lecturer / Volunteer Co-instructor

2019 **Tropical Biology (Study Abroad - Panama), BIO 494**  
School of Life Sciences, Arizona State University

##### Teaching Assistant

2016 **General Ecology, ENVS 230**  
Department of Biodiversity, Earth & Environmental Sciences, Drexel University  
2013 & 2015 **Evolution and Organismal Diversity Lab, BIO 124**  
Department of Biology, Drexel University  
2014 **Drosophila Methods, BIO 480**  
Department of Biology, Drexel University  
2014 **Function and Evolution of Vertebrates, BIO 224**  
Department of Biology, Drexel University  
2013 **Discoveries in Animal Behavior, ENVS 226**  
Department of Biodiversity, Earth & Environmental Sciences, Drexel University  
2013 **Watershed Approach, ENVS 203**  
Department of Biodiversity, Earth & Environmental Sciences, Drexel University  
2013 **Physiology & Ecology Lab, BIO 126**  
Department of Biology, Drexel University, Philadelphia, PA  
2012 **Community Ecology Lab, ENVS 287**  
Department of Biodiversity, Earth & Environmental Sciences, Drexel University

##### High School

2016 **Drexel Environmental Science Leadership Academy (grades 9-12)**  
Department of Biodiversity, Earth & Environmental Sciences, Drexel University

##### Mentorship

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Graduate - 2  
Post-baccalaureate - 4  
Undergraduate – 19  
Undergraduate honors thesis committees served - 1

##### Service

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2020 Annual Meeting of the Animal Behavior Society, Virtual Mentoring Sessions, *mentor*  
2020 Social Insect Research Group - Diversity Equity & Inclusion, *committee member*  
2020 ASU SoLS in-coming student virtual coffee chats, *out-of-classroom personality*  
2019 Entomology 2019 (annual meeting of ESA), *undergraduate student competition judge*

- 2019 56th Annual Conference of the Animal Behavior Society, “social behavior” moderator  
 2019 Workshop on insect inspired models for social behavior, *organizing committee chair*  
 2018-present International Union for the Study of Social Insects - North America, *awards committee*  
 2017 Entomology 2017 (annual meeting of ESA), *student competition judge*  
 2016 Frances Velay Fellowship Program, Drexel/Temple, *mentor*  
 2013-2015 Biology Graduate Student Association, Drexel University, *community chair*

### Manuscripts Refereed

<i>The American Naturalist</i>	<i>Ecology</i>	<i>Journal of Biogeography</i>
<i>Animal Behaviour</i>	<i>Ecology &amp; Evolution</i>	<i>Journal of Insect Science</i>
<i>Behavioral Ecology</i>	<i>Ecosphere</i>	<i>Myrmecological News</i>
<i>Behavioral Ecology &amp; Sociobiology</i>	<i>Functional Ecology</i>	<i>Nature Ecology &amp; Evolution</i>
<i>Biogeography</i>	<i>Global Ecology &amp; Biogeography</i>	<i>Oikos</i>
<i>Biology</i>	<i>Heredity</i>	<i>PLoS ONE</i>
<i>Conservation Physiology</i>	<i>Insect Conservation and Diversity</i>	<i>Revista de Biología Tropical</i>
<i>Current Zoology</i>	<i>Journal of Animal Ecology</i>	<i>Royal Society B: Biological Sciences</i>
		<i>Southwestern Naturalist</i>

### Public Outreach

- 2019 Gamboa Discovery School, Gamboa, Panama (K-4), *guest speaker*  
 2018 Smithsonian Tropical Research Institute, Ant Day, *meet-and-greet scientist*  
 2018 Phoenix March for Science (all ages), *meet-and-greet scientist*  
 2016 Women in Natural Sciences (9-12), Academy of Natural Sciences, *mentor*  
 2014-2015 Philadelphia Science Festival (K-12 + families), *guest exhibitor*  
 2013-2016 Drexel Students Tackling Advanced Research (STAR), *mentor*  
 2013-2015 George Washington Carver Science Fair (grades 4-12), *guest judge*  
 2010-2012 Interactive talks at Orleans Parish Public schools via KIDsmART, *guest entomologist*

### Presentations

†invited, ‡awards, \*coauthored with mentee

### Invited Seminars

- †Baudier KM. Social axes of ecological physiology: Individual to group form and function. NSF-Simons QBio Center, Harvard University. 16 December 2020. Virtual Seminar.  
 †Baudier KM. Social axes of ecological physiology: Individual to group form and function. University of Southern Mississippi. 25 February 2020. Hattiesburg, MS.  
 †Baudier KM. Social axes of ecological physiology: individual to group form and function. San Francisco State University. 11 December 2019. San Francisco, CA.  
 †Baudier KM. Social physiology: Discoveries in group function of tropical social insects. University of Hawaii at Manoa. 23 April 2019. Honolulu, HI.  
 †Baudier KM. Catching more flies with Truvia: Erythritol as a human-safe pesticide. Arid Land Agricultural Research Center (USDA-ARC), 3 December 2018 in Maricopa, AZ  
 †Baudier KM. La tolerancia térmica y la termorregulación de un grupo de hormigas legionarias neotropicales. Reserva Biológica del Bosque Nuboso de Monteverde. 25 April 2016 in Monteverde, Puntarenas, Costa Rica.  
 †Baudier KM. Thermal tolerance in Neotropical army ants: body size, microhabitat & elevational effects. American Entomological Society Monthly Meeting. 26 March 2014. Academy of Natural Sciences in Philadelphia, PA

### Guest Lectures

- †Baudier KM. Social insect macrophysiology. College of Mount Saint Vincent. 5 November 2020. Virtual Lecture.  
 †Baudier KM. Social macrophysiology: using ants to study climate adaptation at big scales. The Community College of Baltimore County. 13 October 2020. Virtual Lecture.

### Workshop Presentations

- †Baudier KM. Insect colony defense strategies as a model for human defense allocation. Workshop on Insect-Inspired Models for Social Behavior (WIIMSB). 14 January 2019 at Arizona State University. Tempe, AZ.
- †Pippin C, Squires E, Baudier KM. Swarming in the presence of adversaries. Workshop: Bio-Inspired Algorithms for Managing Emergent Behavior in Sociotechnical Systems. 14 November 2017 at Arizona State University. Tempe, AZ.

### Conference Talks

- Baudier KM, Ostwald MM, Calixto JM, Cossio FJ, Fewell JH. Thermal benefits of polygyny? Multi-queen desert ant colonies have higher and more uniform heat tolerance. Entomological Society of America. 11-25 Nov 2020. Virtual Meeting.
- Baudier KM. Living walls: An emergent defensive subroutine of army ant raids. Animal Behavior Society. 28-31 July 2020. Virtual Meeting.
- Baudier KM, Barrett M, Bennett MM, Fewell JH, Pavlic TP. Neural and physiological underpinnings of defense specialization in soldiers of the stingless bee *Tetragonisca angustula*. Entomological Society of America. 20 Nov 2019 in St. Louis, MO.
- Baudier KM, Bennett MM, Fewell JH, Pratt SC, Pavlic TP. Ageing modulates defensive tasks performed by soldiers of the stingless bee *Tetragonisca angustula*. 56th Annual Conference of the Animal Behavior Society. 27 July 2019 in Chicago, IL.
- †Baudier KM, Fewell JH, Pavlic TP, Pratt SC. Changing of the guard: Task dynamics of stingless bee nest defense in cleptoparasitic environments. International Union for the Study of Social Insects. 5-10 August 2018 in Guarujá, Brazil
- †Baudier KM, O'Donnell S. Interacting climate scales of army ant thermal tolerance. International Union for the Study of Social Insects. 5-10 August 2018 in Guarujá, Brazil
- Baudier KM, O'Donnell S. Weak links: Behavioral and physiological implications of thermal tolerance variation within insect societies. Entomological Society of America. 8 November 2017 in Denver, CO
- Baudier KM, O'Donnell S. Elevation, site choice, & brood age factors in army ant bivouac thermoregulation. Social Insects in the North-East Regions meeting. 10 December 2016 in Washington, DC
- †Baudier KM. Social thermoregulation along elevational clines: lessons from a Neotropical army ant. Philadelphia Evolution Group. 10 October 2016 in Philadelphia, PA
- Baudier KM, O'Donnell S. Microhabitat, elevation and body size effects on thermal tolerance among Neotropical army ants. International Union for the Study of Social Insects North American Section Colloquium. 24 September 2016 in Orlando, FL
- ‡Baudier KM, O'Donnell S. Thermoregulatory responses to thermal clines: Bivouac function across the wide elevational range of a Neotropical army ant (Formicidae: Dorylinae: *Eciton burchellii parvispinum*). XXV International Congress of Entomology. 27 September 2016 in Orlando, FL
- Baudier KM, O'Donnell S. Geographic patterns of thermoregulation: homeostasis in surface & below-ground bivouacking army ants. Social Insects in the North-East Regions meeting. 10 December 2015 in Scranton, PA
- Baudier KM, O'Donnell S. Social thermal physiology: How superorganismal homeostasis confronts elevational thermal clines (Formicidae: Ecitoninae: *Eciton burchellii parvispinum*). Entomological Society of America National Meeting, 16 November 2015 in Minneapolis, MN
- Baudier KM, O'Donnell S. Microclimate and body size affect thermal tolerance among Neotropical army ants (Ecitoninae). Entomological Society of America National Meeting, 18 November 2014 in Portland, OR
- Baudier KM, Austero M, Schauer C, O'Donnell D. Evolution of larval adhesive structures in the ant subfamily Ponerinae. Entomological Society of America National Meeting, 12 Nov 2013 in Austin, TX
- Baudier KM, Austero M, Schauer C, O'Donnell S. The Evolution of Sticky Tubercles in Ponerine Larvae. Social Insects in the North-East Regions meeting, 24 May 2013 in Newark, NJ
- Strecker R, Baudier KM, Hooper-Bui L. Effects of a d-Limonene product on leaf-cutting ant *Atta texana*. Entomological Society of America National Meeting, 17 Nov 2008 in Reno, NV
- Hooper-Bui L, Wiltz B, Baudier KM. Effect of hurricanes Katrina and Rita on the ant fauna of South Louisiana. XXIII International Conference of Entomology, 6-12 Jul 2008 in Durban, South Africa

Hooper-Bui L, Wiltz B, Baudier KM, Strecker R. Post-Katrina pest ants in south Louisiana. National Conference for Urban Entomology, 17-20 May 2008 in Tulsa, OK

### Conference Posters

- \*Cossio F, Baudier KM. Caste specific neural investment in guards of the stingless bee *Tetragonisca angustula*. BioSciences Southwest Symposium. 1 Nov 2019. Tempe, AZ.
- \*Wu R, Baudier KM. Lipid analysis of stingless bee soldiers (*Tetragonisca angustula*). BioSciences Southwest Symposium. 1 Nov 2019. Tempe, AZ.
- \*Reitnauer KA, Betancourt IS, Baudier KM. Developing a Species Inventory of the Ants [Hymenoptera: Formicidae] of Center City Philadelphia, Pennsylvania Through Fountain Sampling. Entomological Society of Pennsylvania. 3 November 2018 in Millersville, PA
- Baudier KM, O'Donnell S. Hot bivouacs: Nest thermoregulation in subterranean army ants (*Dorylinae: Labidus praedator*). Department of Biodiversity, Earth & Environmental Science Research Day, 10 March 2016 in Philadelphia, PA
- Baudier KM. Bivouac warming in *Labidus praedator*. (wearable poster) Social Insects in the North-East Regions meeting. 10 December 2015 in Scranton, PA
- ‡\*Baudier KM, D'Amelio CL. Measuring thermal physiology to predict animal responses to directional climate change. Drexel Research Day, 1 May 2015 in Philadelphia, PA
- \*Khodak P, Sluger E, Baudier KM, Bulova S, O'Donnell S. Evolutionary ecology of brain structure in army ants (*Formicidae: Ecitoninae*). Colonial Academic Alliance Conference, 28 March 2015 in Philadelphia, PA
- \*Baudier KM, Mudd A, Erickson S, O'Donnell S. The weakest link: Body size and species differences in heat tolerance among Neotropical army ants. Drexel research day, 10 April 2014 in Philadelphia, PA
- \*Baudier KM, Mudd A, Erickson S, O'Donnell D. The weakest link: Body size and species differences in heat tolerance among Neotropical army ants. College of Arts & Sciences Research Day, 18 February 2014 in Philadelphia PA
- Baudier KM, Austero M, Schauer C, O'Donnell S. Sticky fingers: Evolution and mechanism of larval adhesive structures in ponerine ants. Drexel University College of Arts & Sciences Research Day, 9 April 2013 in Philadelphia, PA
- Baudier KM, Hooper-Bui L. Impacts of Flooding on Ant Diversity in Urban and Rural Regions of Southern Louisiana. International Union for the Study of Social Insects North American Chapter Meeting, 5-7 October 2012 in Greensboro, NC
- Hooper-Bui L, Lee A, Baudier KM. Maximizing student learning through active learning in entomology: service learning, case studies, and wikis. XXIII International Conference of Entomology, 6-12 July 2008 in Durban, South Africa