

MICHAEL W. SEARS, PH.D.

Department Of Biology
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EDUCATION

Degrees

- Ph.D., University of Pennsylvania, *Ecology & Evolutionary Biology*, August 2001
- B.S., Rhodes College, *Biology*, May 1993

Academic honors

- National Science Foundation Postdoctoral Fellowship in Biological Informatics, 2002-2004.
- National Science Foundation Graduate Research Trainee, 1999-2000.
- National Science Foundation Research Experience for Undergraduates, Savannah River Ecology Laboratory, 1991.
- Rhodes College University Scholarship, 1989-1993.

PROFESSIONAL EXPERIENCE

Assistant Professor, Department of Biology, 7/01/2009-present

Bryn Mawr College, Bryn Mawr, PA

- Developing individually-based landscape models for predicting species distributions, especially with regard to climate change
- Testing models that predict the costs and benefits of behavioral thermoregulation
- Developing predictive models of thermal reaction norms
- Developing models that predict the spread of Chytrid disease in amphibians over landscapes

Assistant Professor, Department of Zoology, 12/2005-7/01/2009

Southern Illinois University, Carbondale, IL

- Developed an explicit formulation of the cost-benefit model of thermoregulation and currently conducting empirical tests of this model in large-scale field enclosures.
- Developed evolutionary algorithms to optimize movement strategies of ectotherms given constraints imposed by spatial arrangements of thermal resources, food

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resources, and predation risks.

- Developed mechanistic models of species ranges with applications for climate change.
- Implemented temperature-dependent dynamics into epidemiological models of Chytrid disease-frog interactions for tropical amphibians
- Conducted empirical tests of optimality theory with regard to physiological acclimation.

Post-doctoral Fellow, Department of Biology, 5/2004-12/2005

University of Nevada, Reno, NV

- Determined the relationships between physiological characteristics, such as maximum metabolic rates, and rates of activity in free-ranging (using robust modeling methods) and laboratory deer mice.
- Initiated selection studies on mice to break the positive correlation between maximal metabolic rates and basal metabolic rates, thereby directly testing the aerobic capacity model for the evolution of endothermy.

Post-doctoral Research Associate, 2002-2004

Indiana State University, Terre Haute, IN

- Developed neural network models to predict the spatial distribution of operative temperatures using remotely-sensed habitat data and micrometeorological data.
- Implemented neural network model to predict potential nesting habitats of Eastern fence lizards in the NJ Pine Barons.
- Developed a model of thermal habitat suitability for the threatened sand dunes lizard in the Mescalero Sand Dunes, NM.

Research Associate, 2000-2002

Biological Resource Research Center

University of Nevada, Reno, NV

- Designed and implemented inventory and monitoring studies for squamate reptile diversity in the Mojave Desert in Clark County, NV.
- Identified potential indicator species that predict local reptile diversity.

GRANTS AND FUNDING

Pending Proposals

National Science Foundation (\$100,000) Transforming Undergraduate Education in Science (Type-1 grant) co-PI with Deepak Kumar

Collaborative Research: Science of Information: Bringing Many Disciplines Together

- We plan to develop the resources for an undergraduate curriculum in the science of information

Funded proposals and other funding

National Science Foundation (\$25,000,000), funded collaborator, 2009-2014

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Science Technology Center: Center for the Science of Information

- Developing teaching modules to be used for courses in Ecological Informatics and the Introduction to the Science of Information

Society of Integrative and Comparative Biology (\$2000).

Symposium, “A synthetic approach to the response of organisms to climate change: The role of thermal adaptation”

National Science Foundation (\$49,250), 2009-2010.

Starter Grant: “Testing simulation models of animal movement under thermoregulatory constraint”

- Developing a model lab system to test models using *Tribolium* beetles

National Science Foundation (\$89,000 to **Michael Sears**, PI at SIUC; \$240,000 total). PI with Michael Angilletta (Indiana State University) and Co-PI William Mitchell (Indiana State University). 2006-2008.

Collaborative Research: “Toward a spatially-explicit theory of the cost of thermoregulation”

- Generated simulations of animal movement that incorporate thermoregulatory decisions.
- Testing predictions from simulations with fence lizards in field enclosures.

National Science Foundation (\$15,000), Co-PI with Michael Angilletta, 2003.

Symposium: “The evolution of thermal reaction norms for growth rate and body size for ectotherms”

- Acquired funds to support the organization, travel, and publication expenses for a symposium comprised of twelve speakers from the US and Europe at the 2004 Annual Meeting of the Society of Integrative and Comparative Biology in New Orleans, LA.

National Science Foundation (\$100,000), 2002-2004.

Postdoctoral Fellowship in Biological Informatics: “Quantitative mapping of the thermal environments of small animals across scales”

- Created artificial neural network models of small scale thermal environments with respect to the operative environment of ectotherms
- Created models of movements using random walks constrained by thermoregulation.

PUBLICATIONS

In preparation

Sears MW, MJ Angilletta. The costs and benefits of thermoregulation revisited: statistical and spatial distributions of environmental temperatures drive energetic costs (for *Ecology Letters*).

Angilletta MJ*, **MW Sears***, MS Schuler, M Stegman, K Dilliplane, W Mitchell. Experimental

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evidence for the cost of thermoregulation: a mesocosm approach (for *Science*). *Both authors have contributed equally to this manuscript.

Sears MW, KA Artita. Integrating behavioral thermoregulation and physiological performance to predict optimal movement through thermally-structured landscapes (for *Animal Behaviour*).

Sears MW, MJ Angilletta, E Raskin, LA Fitzgerald, GS Bakken. Toward a spatially-explicit thermal ecology: predicting activity from thermally-constrained dispersal through modeled bioenergetic landscapes (for *Ecology*).

Sears, MW. Evidence for episodic selection on body size in free-ranging sagebrush lizards, *Sceloporus graciosus*. *Journal of Evolutionary Biology* (in revision).

In review

Wone B, ER Donovan, MK Labocha, **MW Sears**, CJ Downs, JP Hayes. Response to selection on metabolic rate in laboratory mice: a test of the aerobic capacity model. (in revision for *Evolution*).

Bogosian V III, EC Hellgren, **M Sears**, RW Moody. A High-resolution niche suitability model combining correlative and process-based approaches (in revision for *Ecological Modelling*).

Peer-reviewed publications

Niehaus AC, MJ Angilletta, **MW Sears**, CE Franklin, RS Wilson (2011) Predicting anuran phenotypes in complex thermal environments. *Journal of Experimental Biology*, in press.

Sears MW, MJ Angilletta (2011) Responses of organisms to climate change: a synthetic approach to the role of thermal adaptation. *Integrative and Comparative Biology* 51, in press.

Angilletta, MJ, **MW Sears** (2011) Coordinating theoretical and empirical efforts to understand the linkages between organisms and environments. *Integrative and Comparative Biology* 51, in press.

Sears MW, E Raskin, MJ Angilletta (2011) The world is not flat: Defining relevant thermal landscapes in the context of climate change. *Integrative and Comparative Biology* 51, in press.

Schuler MS, JJ Storm, **MW Sears**, BS Cooper, BH Williams, MJ Angilletta (2011) Isopods failed to acclimate their thermal sensitivity of locomotor performance during predictable or stochastic cooling. *Public Library of Science ONE* 6:e20905.

Schuler MS, MJ Angilletta, **MW Sears** (2011) Food availability does not affect the preferred body temperature of Yarrow's spiny lizard. *Journal of Thermal Biology* 36:112-115.

Buckley L, M Urban, M Angilletta, L Crozier, L Rissler, **M Sears** (2010) Putting concepts in species distribution modeling into practice: contrasting correlative and mechanistic approaches. *Ecology Letters* 13: 1041-1054.

Sears MW, JP Hayes, M Banta, D McCormick. (2009) Out in the cold: physiological capacity influences behavior in deer mice. *Functional Ecology* 23: 774-783.

Wone B, **MW Sears**, M Labocha, E. Donovan, JP Hayes (2009) Genetic variances and covariances of metabolic traits in *Mus musculus* and a genetic test of the aerobic capacity model for the evolution of endothermy *Proceedings of the Royal Society of London B* 276: 3695-3704.

Angilletta MJ, **MW Sears** & R Pringle. (2009) The spatial dynamics of nesting behavior: lizards

- shift microhabitats to construct nests with beneficial thermal properties. *Ecology* 90: 2933-2939.
- Sears MW**, J Diffendorfer, KL Lips, JR Mendelson III (2008) Amphibian declines and issues of inference: response to Parmesan and Singer. *Public Library of Science Biology* 14 April 2008.
- Lips KR, J Diffendorfer, JR Mendelson III, **MW Sears** (2008) Riding the wave: Climate change, disease, and amphibian declines. *Public Library of Science Biology* 6: 441-454.
- Angilletta MJ, RS Wilson, AC Niehaus, PL Ribeiro, **MW Sears**, CA Navas (2007) Urban physiology: city ants possess high heat tolerance. *Public Library of Science One*, 2: e258.
- Tull JC, **MW Sears** (2007) Moist seeds increase rodent trap success. *Western North American Naturalist* 67: 520-523.
- Sears MW**, JP Hayes, CS O'Connor, K Geluso, J Sedinger (2006) Individual variation in thermogenic capacity affects above-ground activity of high altitude deer mice. *Functional Ecology*, 20: 97-104.
- Sears MW** (2005) Geographic variation in the life history of the sagebrush lizard: the role of thermal constraints on activity. *Oecologia* 143: 25-36.
- Sears MW** (2005) Resting metabolic expenditure as a potential source of variation in growth rates of the sagebrush lizard. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology* 140: 171-177.
- Angilletta MJ, **MW Sears** (2004) The evolution of thermal reaction norms for growth rate and body size in ectotherms: an introduction to the symposium. *Integrative and Comparative Biology* (formerly *American Zoologist*) 44: 401-402.
- Sears MW**, MJ Angilletta (2004) Body size clines in *Sceloporus* lizards: proximate mechanisms and demographic constraints. *Integrative and Comparative Biology* (formerly *American Zoologist*) 44: 433-442.
- Angilletta MJ, **MW Sears**, TD Steury (2004) Temperature, growth rate, and body size in ectotherms: fitting pieces of a life history puzzle. *Integrative and Comparative Biology* (formerly *American Zoologist*) 44: 498-509.
- Angilletta MJ, CE Oufiero, **MW Sears** (2004) Thermal adaptation of maternal and embryonic phenotypes in a geographically widespread ectotherm. *Proceedings of the Third International Conference of Comparative Physiology and Biochemistry, International Congress Series* 1275: 258-266.
- Sears MW**, MJ Angilletta (2003) Life history variation in the sagebrush lizard (*Sceloporus graciosus*): phenotypic plasticity or local adaptation? *Ecology* 84:1624-1634.
- Angilletta MJ, **MW Sears** (2003) Parental care as a selective factor for the evolution of endothermy? *American Naturalist* 162: 821-825.
- Angilletta MJ, **MW Sears**, RS Winters (2001) Seasonal variation in reproductive effort and its consequences for offspring size in the lizard *Sceloporus undulatus*. *Herpetologica* 57: 365-75.
- Angilletta MJ, **MW Sears** (2000) Metabolic cost of reproduction in an oviparous lizard. *Functional Ecology* 14:39-45.
- Kesler DH, T Moore, **M Sears**, J Scherer, R Pardiek, R Reardon (1994) Two larval odonate communities of the Edward J. Meeman Biological Station in western Tennessee. *Journal of the Tennessee Academy of Sciences* 69: 59-62.

Reports to agencies

- Fitzgerald LA, **MW Sears**, C.W. Painter (2005) Inter-dune dispersal of sand dune lizards (*Sceloporus arenicolus*) in the Mescalero Sands Ecosystem. Annual Report to the New Mexico Fish and Game.
- Sears MW**, DD, Murphy, CR Tracy (2002) Effects of off-road use on communities of lizards and small mammals in the Mojave desert. Clark County Multiple Species Habitat Conservation Plan Annual Report.

PRESENTATIONS

Invited Seminars & Symposia

- Sears MW** (2011) Challenges for predicting the responses of organisms to changing climates. Invited Seminar, Villanova University.
- Sears MW** (2011) The Promise and Perils of Predicting Species Ranges in a Changing World. Invited talk, Cramer Seminar Series, Dartmouth College.
- Sears MW** (2011) Challenges for understanding the responses of organisms to climate change: Addressing thermal heterogeneity through space and time. Invited seminar, The Ecosystems Center, Marine Biological Laboratory at Woods Hole, MA. February 22, 2011.
- Sears MW** (2011) The Promise and Perils of Predicting Species Ranges in a Changing World. Invited seminar, Temple University.
- Angilletta MJ, **MW Sears**, Lauren Buckley. 2011. The yin and yang of thermal adaptation: physiological and behavioural plasticities in a warming world. Plenary seminar, Annual Meeting of the Society of Experimental Biology, Glasgow, Scotland. July 2011.
- Angilletta MJ, **MW Sears**, Lauren Buckley. 2011. Behavioral responses to climate change. Research Experience for Undergraduate Seminar Series, Sevilleta Long Term Ecological Research Station, University of New Mexico.
- Sears MW**, MJ Angilletta (2011) The world is not flat: defining the thermal landscape...again. *Symposia talk for A Synthetic Approach to the Response of Organisms to Climate Change: The Role of Thermal Adaptation* at the SICB Annual Meeting, Salt Lake City, UT.
- Angilletta MJ, **MW Sears** (2011) The role of evolutionary theory in predicting responses to environmental warming. *Symposia talk for A Synthetic Approach to the Response of Organisms to Climate Change: The Role of Thermal Adaptation* at the SICB Annual Meeting, Salt Lake City, UT.
- Sears MW** (2010) The world is not flat: Implications for managing the impacts of climate change. Ecolunch seminar series, University of Pennsylvania.
- Sears MW** (2010) Going on the Academic Job Market: Advice from faculty members. Academic Career Conference series sponsored by Career Services and the Vice Provost for Education at the University of Pennsylvania.
- Sears MW**, MJ Angilletta (2010) Adaptation of thermal reaction norms along a latitudinal gradient: implications for the responses of species ranges to climate. Invited talk in symposium entitled, "Does Biology (physiology, ecology, evolution) Matter in Predicting How Species' Distributions Will Respond to Climate Change?" at the 95th Annual Meeting of the Ecological Society of America held in Pittsburgh, PA.
- Sears MW** (2010) Why Good Models of Species Ranges Fail: Relationships of Individuals with Landscapes...It's Complicated. Ecology and Evolution Seminar Series, Rutgers University

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- Sears MW** (2010) Toward a spatially-explicit theory of behavioral thermoregulation, or how I gave up lizards for electrons. MathBio Seminar Series, Swarthmore College.
- Angilletta MJ, **MW Sears** (2009) Invited seminar, Darwin's Living Legacy: A Conference on Evolution and Society in Alexandria, Egypt.
- Sears MW** (2009) The promise and perils of modeling species ranges: Why good models fail. Symposia speaker, 10th Annual Bioscience Research & Technology Review Day, University of Maryland.
- Sears MW** (2009) What can individual movements of thermoregulating organisms tell us about species response to climate change? Seminar, Department of Biology, St. Joseph's University, Philadelphia, PA.
- Sears MW** (2009) Turning up the heat on lizards: integrating principles of dispersal and thermoregulation to better understand responses to climate. Seminar, Department of Biology, Rhodes College, Memphis, TN.
- Sears MW** (2008) Integrating animal dispersal and thermoregulation: theoretical considerations and practical applications. Seminar, Department of Biology, Bryn Mawr College, Philadelphia, PA.
- Sears MW** (2008) Spatial aspects of thermoregulation: theoretical, experimental, and natural perspectives. Seminar, Department of Biological Sciences, Clemson University.
- Sears MW** (2008) Integrating animal dispersal and thermoregulation: theoretical considerations and practical applications. Seminar, Sevilleta Longterm Ecological Research Field Station, University of New Mexico.
- Lips K, J Diffendorfer, J Mendelson, **M Sears** (2007). Amphibian population declines, disease, and climate change. Organized Oral Session: *Climate Change and Disease Ecology: Challenges to the Restoration and Maintenance of Suitable Pestilence*. Ecological Society of America, Annual Meeting to be held in San Jose, CA.
- Sears MW** (2007) Evaluating and refining tests of the cost-benefit model of thermoregulation: a spatially-explicit perspective. Seminar, Department of Biology, University of Nevada, Reno.
- Sears MW** (2007) Animal movements and thermoregulation: a spatially-explicit perspective. NCEAS working group on Dynamic Species Ranges, Santa Barbara, CA.
- Sears MW** (2006) Evaluating tests of the cost-benefit model of thermoregulation: perspectives from space. Seminar, Center for Ecology, Southern Illinois University, Carbondale.
- Sears MW** (2006) Toward a spatially-explicit view of the thermal ecology of lizards. Seminar, Herpetology Group, Washington University at St. Louis.
- Sears MW** (2006) Toward a spatially explicit theory of thermoregulation. Seminar, Center for Ecology, Southern Illinois University, Carbondale.
- Sears MW** (2005) Flatland revisited, or what it really means to be a small thermoregulating ectotherm. Seminar, Department of Biology, University of California, Riverside.
- Sears MW** (2005) The influence of thermal resources on the ecology of lizards: from individuals to landscapes. Seminar, Department of Zoology, Southern Illinois University, Carbondale.
- Sears MW** (2005) Constructing spatially-explicit maps of operative temperatures for small ectotherms. Seminar, Department of Ecology and Organismal Biology. Indiana State University.
- Angilletta, M.J, CE Oufiero, **MW Sears** (2004) Maternal behavior and embryonic physiology: conflict or compromise? From the symposium titled, "Thermal Biology of Reptiles and Amphibians," held at the Third International Conference of Comparative Physiology and

Biochemistry. Ithala, S. Africa.

- Sears MW** (2004) The influence of thermal resources on the ecology of lizards: from individuals to landscapes. Seminar, Kellogg Biological Station, Michigan State University.
- Sears MW**, MJ Angilletta, CE Oufiero & WP Porter (2004) Getting back to nature: ecological influences on patterns of growth and body size in squamate reptiles. Symposium: *The evolution of thermal reaction norms for growth rate and body size for ectotherms*. Society for Integrative and Comparative Biology, Annual Meeting held New Orleans, LA.
- Angilletta MJ, **MW Sears**, TD Steury (2004) Temperature, growth rate, and body size in ectotherms: fitting pieces of a life history puzzle. Symposium: *The evolution of thermal reaction norms for growth rate and body size for ectotherms*. Society for Integrative and Comparative Biology, Annual Meeting held in New Orleans, LA.
- Sears MW** (2001) Phenotypic plasticity of life history in the sagebrush lizard. Seminar, Department of Life Sciences, Indiana State University.

Contributions at meetings

- Sears MW**, MJ Angilletta, LB Buckley (2012) Responses of species to climate change: the role of thermal adaptation of thermal reaction norms. Annual Meeting of the Society of Integrative and Comparative Biology to be held in Charleston, SC.
- Wang C, **MW Sears** (2012) Challenges of modeling the environments of animals: Features of geospatial datasets bias predictions of thermal heterogeneity. Annual Meeting of the Society of Integrative and Comparative Biology to be held in Charleston, SC.
- Sears MW** (2010) Spatial arrangements of thermal habitat mediate competition for space. Annual Meeting of the Society of Integrative and Comparative Biology held in Seattle, WA.
- Bogosian V III, EC Hellgren, **M Sears**, RW Moody (2010) Application of ecological niche modeling to translocation efforts. Annual Meeting of The Wildlife Society, Snowbird, UT.
- Sears MW** (2009) Implications of habitat selection and dispersal for the responses of small ectotherms to climate change. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Sears MW**, T Polnaszek, KS Artita (2009) Optimal decision rules for movement under activity-mortality tradeoffs for small ectotherms in thermally-structured landscapes. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Angilletta MJ, **MW Sears**, M Schuler, WA Mitchell, T Rouche (2009) Testing models of behavioral thermoregulation in a spatially-explicit context: a large-scale field experiment. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Artita KS, T Polnaszek, **MW Sears** (2009) Strategies for optimization in behavioral and ecological research using evolutionary computation. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Polnaszek T, KA Artita, **MW Sears** (2009) Should I stay or should I go? Optimal decisions for attack and flight during predator-prey interactions. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Schuler MS, JJ Storm, **MW Sears**, BS Cooper, BH Williams, MJ Angilletta (2009) Acclimation of thermal physiology in predictable and stochastic environments: a test of optimality theory. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.

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- Bockoven A, M Amarello, **MW Sears** (2009) Implications of tradeoffs between crypsis and thermoregulation for the evolution of animal coloration. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Smith JJ, **MW Sears** (2009) The implications of body size for habitat selection as a consequence of behavioral thermoregulation. Annual Meeting of the Society of Integrative and Comparative Biology held in Boston, MA.
- Artita KS, **MW Sears**, JW Nicklow (2009) Sensitivity analysis and automatic calibration in SWAT2005: Is built-in better? World Environmental & Water Resources Congress held in Kansas City, MO.
- Becker SN, K Lips, **M Sears** (2009) Hanging out with the cool frogs: Operative and body temperature effects on population response to disease. Ecological Society of America, Annual Meeting held in Albuquerque, NM.
- Sears MW**, KS Artita, T Shrout (2008) Using evolutionary algorithms to predict optimal navigational decisions through thermally-structured habitats. Society for Integrative and Comparative Biology, Annual Meeting held in San Antonio, TX.
- Sears MW**, MJ Angilletta (2008) Evaluating the costs of thermoregulation: using movement and spatial arrangement of thermal resources to define cost curves for small lizards. Society for Integrative and Comparative Biology, Annual Meeting held in San Antonio, TX.
- Bogosian V III, EC Hellgren, **MW Sears**, RW Moody (2009) Translocation of Texas horned lizards: Can niche modeling save the horny toad? Annual Meeting of The Wildlife Society, Monterey, CA.
- JJ Smith, **MW Sears** (2008) Perspectives of scale: the influence of body size, thermoregulation, and movement on the potential for interspecific interactions. Society for Integrative and Comparative Biology, Annual Meeting held in San Antonio, TX
- Wone, B, **MW Sears**, MK Lobocho, ER Donovan, JP Hayes (2008) Heritability and genetic trends for metabolic traits in laboratory mice. Society for Integrative and Comparative Biology, Annual Meeting held in San Antonio, TX.
- Niehaus, AC, MJ Angilletta, **MW Sears**, CE Franklin, RS Wilson. (2008) Growing up in an unstable environment: Consequences of diel thermal variation to developing anurans. Society for Integrative and Comparative Biology, Annual Meeting held in San Antonio, TX.
- Logan M, **MW Sears**, M Angilletta (2008) Being a mom isn't always so hot: the effects of reproductive status on thermoregulatory behavior in squamate reptiles. Society for Integrative and Comparative Biology, Annual Meeting held in San Antonio, TX.
- Sears MW** (2007) Animal movements and thermoregulation: a spatially-explicit perspective. National Center for Ecological Analysis and Synthesis working group on Dynamic Species Ranges, Santa Barbara, CA.
- Sears MW** (2007) Exploring the influence of micro-scale spatial arrangements of surface temperatures on animal movements under climate change scenarios. Ecological Society of America, Annual Meeting to be held in San Jose, CA.
- Sears MW** (2007) Proceed with caution: invalidating tests of the cost-benefit model of thermoregulation with spatially-explicit movement simulations. Society for Integrative and Comparative Biology, Annual Meeting held in Phoenix, AZ.
- Hayes JP, **MW Sears**, CS O'Connor, M Banta (2006) Out in the cold: physiological performance influences individual behavior in deer mice. Society for Integrative and Comparative

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- Biology, Annual Meeting held in Orlando, FL.
- Sears MW**, JP Hayes, K Geluso, CS O'Connor (2005) Physiological correlates of behavior: does maximal oxygen consumption influence activity in free-ranging deer mice? Society for Integrative and Comparative Biology, Annual Meeting held in San Diego, CA.
- Sears MW**, GS Bakken, MJ Angilletta, L Fitzgerald (2005) Using artificial neural networks to model the operative temperatures of small animals in a spatially-explicit context. Society for Integrative and Comparative Biology, Annual Meeting held in San Diego, CA.
- Sears MW**, KE Nussear, ET Simandle, CR Tracy (2002) Size, color, and position *do* matter: the influence of physical attributes on the performance of operative temperature models. Society of Ichthyologists and Herpetologists, Annual Meeting in Kansas City, MO.
- Sears MW**, AE Dunham (2002) The influence of thermal heterogeneity on life history variation among elevationally separated populations of sagebrush lizards. Society for Integrative and Comparative Biology, Annual Meeting held in Anaheim, CA.
- Sears MW**, MJ Angilletta (2001) Phenotypic plasticity of life history in the sagebrush lizard (*Sceloporus graciosus*). Society for the Study of Amphibians and Reptiles, Annual Meeting held in Indianapolis, IN.
- Angilletta MJ, **MW Sears** (2001) Latitudinal variation in the growth efficiency of lizard embryos. Society for the Study of Amphibians and Reptiles, Annual Meeting held in Indianapolis, IN.
- Sears MW**, MJ Angilletta (2000) The effect of water supplementation on hatchling growth in the sagebrush lizard (*Sceloporus graciosus*). Ecological Society of America, Annual Meeting held in Park City, UT.
- Sears MW** (2000) Sources of variation in growth in the sagebrush lizard. Penn-Princeton Colloquium held at the University of Pennsylvania, Philadelphia, PA.
- Sears MW** (2000) Metabolic expenditure as a proximate source of variation in growth in the sagebrush lizard (*Sceloporus graciosus*). Society for Integrative and Comparative Biology, Annual Meeting held in Atlanta, GA.
- Angilletta MJ, **MW Sears** (2000) Intraspecific variation in the energy budgets of lizard embryos. Society for Integrative and Comparative Biology, Annual Meeting held in Atlanta, GA.
- Angilletta, MJ, **MW Sears** (1999) The metabolic cost of reproduction in an oviparous lizard. Society for Integrative and Comparative Biology, Annual Meeting held in Denver, CO.
- Methratta ET, R Sherwood, **M Sears**, C Cabbage (1997) Meta-analysis of positive interactions in marine systems. Benthic Ecology Meeting, Portland, Maine.
- Sears MW** (1992) Variation in lipid composition among juvenile and adult mosquitofish (*Gambusia affinis*) from contrasting environments. Pew Midstates Consortium for Undergraduate Research Symposium held in St. Louis, MO.
- Sears MW**, T Hill (1990) Non-denaturing electrophoresis of cellulases in the Oomycete fungus, *Achlya ambisexualis*. Tennessee Academy of Sciences, Western Division Annual Meeting held in Memphis, TN.

SYNERGISTIC ACTIVITIES

Program Officer for the Division of Ecology and Evolution of the Society for Integrative and Comparative Biology. Term from January 2009-January 2012.

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- Member of Program Committee for the Society of Integrative and Comparative Biology. Term from 2009-2012.
- Member of the Tri-College Working Group on Environmental Studies charged with the goal of creating a shared environmental studies concentration/minor. Fall 2011.
- Symposium organizer, "Responses of organisms to climate change: a synthetic approach to the role of thermal adaptation", for the 2011 Annual Meeting of the Society for Integrative and Comparative Biology in Salt Lake City, UT.
- Judge for Best Student Paper and Best Postdoctoral Presentation at the Annual Meeting of the Ecological Society of America. 2011.
- Member of the Environmental Studies Steering Committee at Bryn Mawr College. 2009-present.
- Member of the Environmental Studies Curriculum Subcommittee at Bryn Mawr College. 2011.
- Member of the search committee for an environmental biologist at Haverford College. Fall 2011.
- Ad hoc proposal reviewer for IOS and DEB at the National Science Foundation. 2010-2011.
- Served on 4 panels for the Divisions of Environmental Biology and Integrative Organismal Systems at the National Science Foundation during 2010-2011 in Washington, D.C.
- Associate Editor for the journal *Herpetologica*. 2006 to 2009.
- Served on Panel for the Biological Informatics Postdoctoral Fellowship Program of the National Science Foundation. February 2008 in Washington, D.C.
- Working group entitled, "Mechanistic distribution models: Energetics, fitness, and population dynamics." Four week-long meetings to be held during 2007-2011. Co-sponsored by the Nation Center for Ecological Analysis Synthesis (NCEAS) and the National Evolutionary Synthesis Center (NESCent).
- Reviewer for an international postdoctoral fellowship for National Science Foundation, January 2007.
- Ecosystem Modeling Workshop of the Hovsgol GEF Study Area. Held May 14-24, 2006 at Hustain Nuruu, Mongolia. Sponsored by GEF/World Bank.
- Nomadic Pastoralism and Climate Change in Inner Asia. Held May 25-26, 2006 at Ulaanbaatar, Mongolia. Sponsored by GEF/World Bank.
- Served on Panel for the Biological Informatics Postdoctoral Fellowship Program of the National Science Foundation. June 2006 in Washington, D.C.

STUDENT ADVISEMENT

Current and past undergraduate advisees

- Jessica Arbon ('14), Bryn Mawr College, undergraduate independent research (beginning spring/summer '12).
- Abby Hochman ('13), Bryn Mawr College, undergraduate independent research (beginning spring '12).
- Congwen Wang ('13), Bryn Mawr College, undergraduate independent research, Costs and benefits of animal coloration with regard to thermoregulation and predation.
- Madison Schaeffer ('11), Bryn Mawr College, undergraduate independent research, Testing

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models of animal movement in *Tribolium*.

Evan Raskin ('10) Haverford College, undergraduate independent research, The influence of spatial heterogeneity on animal movements.

Monica Stegmann ('10) Haverford College, NSF Research Experience for Undergrads & undergraduate independent research, Validation of a new methodology to predict operative environmental temperatures.

Kathy Dilliplane ('10) Bryn Mawr College, NSF Research Experience for Undergrads. Field tests of models that predict the costs of behavioral thermoregulation.

Michael Logan ('07), SIUC, undergraduate independent research. Topic: "Thermoregulatory behavior of squamate reptiles with respect to reproduction."

Sara Owusu ('09), SIUC, undergraduate independent research, funded through the Illinois Louis Stokes Alliance for Minority Participation & McNair Scholars programs. Topic: "Heritability of correlated metabolic traits in white footed mice."

Past graduate advisees

Jeff Smith, Doctoral candidate. Topic: "Niche partitioning along spatio-temporal axes of thermal resources"

Tim Polnaszek, Masters candidate. Title: "Prediction of optimal decisions for attack and flight during predator-prey interactions using evolutionary programming techniques." (currently a Ph.D. candidate at the University of Minnesota)

Alison Bockoven, Masters candidate. Topic: "Influence of tradeoffs between crypsis and thermoregulation on the evolution of coloration in lizards" (currently a Ph.D. candidate at the Texas A&M University)

Melissa Amarello, Doctoral candidate. Title: "Proximate factors underlying geographic patterns of body size in a wide-ranging snake, *Pituophis catenifer*" (currently a Ph.D. candidate at the Arizona State University)

External committee member

Elliot Quinn (2010) The role of energy expenditure in resource acquisition and energy allocation in free-ranging North American red squirrels (*Tamiasciurus hudsonicus*). Ph.D., McGill University.

Past committees:

Matt Schuler, Masters candidate, Indiana State University. Title: "Experimental tests of the cost-benefit model of behavioral thermoregulation in lizards"

Sara Becker, Masters Candidate, Southern Illinois University. Topic: "Microhabitat use of frogs in the tropics with respect to chytrid disease"

Jamie Jordan, Ph.D. candidate, Indiana State University. Title: "Interplay between habitat selection and predator avoidance in eastern fence lizards"

Roberto Brenes, Ph.D. candidate, Southern Illinois University. Title: "Ecological role of tadpoles in tropical montane streams of central Panama"

Student funding while under my advisement

Jeff Smith 2008. Theodore Roosevelt Memorial Grant (AMNH), \$1500.

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Melissa Amarello 2008. Sigma Xi Grant in Aid of Research, \$500.

Alison Bockoven. 2008-2009. SIU Master's Fellowship, \$25107.

Tim Polnaszek. 2008-2009. SIU Master's Fellowship, \$25107.

TEACHING EXPERIENCE

Bryn Mawr College, 2009-present.

Department of Biology

Courses Taught: Ecology, Ecology Lab, Computational Methods, Biological Investigations, Introduction to Environmental Studies

Courses developed and submitted to the curriculum: Evolutionary Ecology

Southern Illinois University, 2006-2009.

Department of Zoology

Courses taught: Organismal Functional Biology, Comparative Physiology, Senior Seminar, Evolutionary Ecology, Biophysical and Physiological Ecology, Computational Methods for Ecological Modeling, Advanced Computational Methods for Ecological Modeling

Courses developed and submitted to the curriculum: Evolutionary Ecology, Computational Methods for Ecological Modeling

Guest lecturer, Herpetology. Taught a lecture on body size clines in reptiles.

Indiana State University, 2004.

Department of Life Sciences

Guest Lecturer, Anatomy and Physiology

Taught a lecture on cellular respiration covering glycolysis, the Krebs cycle, and the electron transport chain.

University of Nevada, Reno, 2000.

Department of Biology

Guest Lecturer, Herpetology

Taught a series of three lectures covering the life cycles, life history, and reproductive physiology of amphibians and reptiles.

University of Pennsylvania, 2000.

School of Arts & Sciences, Department of Biology

Guest Lecturer, Introductory Biology

Taught two lectures covering behavioral and physiological thermoregulation, and the structure and function of muscles.

University of Pennsylvania, 1999.

School of Arts & Sciences, Department of Biology

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Guest Lecturer, Introductory Ecology

Taught a lecture on the physiological ecology of ectotherms.

University of Pennsylvania, 1995-1999.

School of Arts & Sciences, Department of Biology

Teaching Fellow:

Taught laboratories for Introductory Cellular Biology (2 semesters), Introductory Organismal Biology (1 semester). Led weekly one-hour recitations for Vertebrate Physiology (1 semester), Human Biology for Non-majors (1 semester), Introductory Ecology (1 semester), and Conservation Biology (1 semester). For all courses, wrote and graded exams, led review sessions, held office hours for individual tutoring, and aided with grade assignment.

University of Pennsylvania, 1996-1998.

College of General Studies, Department of Biology

Teaching Assistant:

Taught laboratory sections for Introductory Cellular Biology (2 semesters) and Introductory Organismal Biology (2 semesters).

University of Pennsylvania, 1996.

School of Arts & Sciences, Department of Biology

Head Teaching Assistant, Introductory Organismal Biology

Coordinated sixteen laboratory sections and supervised eight teaching assistants. Fulfilled administrative duties for the lecture portion of the course. Prepared teaching assistants for weekly laboratory sessions. Wrote and graded student examinations. Aided with grade assignment.

PROFESSIONAL AFFILIATIONS

Society for Integrative and Comparative Biology, 1997-present.

Ecological Society of America, 2001-present.

American Society of Naturalists, 2002-present.

JOURNAL REFEREE

Oecologia (2000, 2008, 2009), *Journal of Herpetology* (2001, 2004, 2005), *Evolution* (2002), *Copeia* (2002-2003, 2008), *Journal of Wildlife Management* (2002), *Herpetological Monographs* (2003, 2004), *Herpetologica* (2004, 2006, 2007, 2010), *Integrative and Comparative Biology* (2004), *Journal of Animal Ecology* (2005, 2006, 2010), *Physiological and Biochemical Zoology* (2006, 2009, 2010), *Acta Zoologica Sinica* (2006), *American Naturalist* (2007, 2008, 2010), *Herpetological*

CURRICULUM VITAE

Reviews (2007), *Functional Ecology* (2007, 2009, 2010), *Biological Journal of the Linnaean Society* (2007, 2009), *Ecology* (2007,2009), *Ecological Applications* (2010), *Ecography* (2008), *Comparative Biochemistry and Physiology* (2008), *Evolutionary Ecology* (2008), *Biological Conservation* (2008), *Current Zoology* (2008), *PLoS ONE* (2009, 2011), *Animal Behavior* (2010), *Journal of Comparative Physiology* (2011), *Science* (2011)

REFERENCES

Primary References

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Secondary references

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Dr. Lee Fitzgerald, Professor
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