Daniel S. Moen

Dept. Integrative Biology, Oklahoma State University
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EDUCATION

2012 Ph.D. Stony Brook University (Ecology & Evolution)
2003 B.A. North Dakota State University (Zoology, with Honor)

ACADEMIC POSITIONS

2021–present Associate Professor, Dept. Integrative Biology, Oklahoma State University
2015–2021 Assistant Professor, Dept. Integrative Biology, Oklahoma State University
2014–2015 Darwin Post-doctoral Fellow, Graduate Program in Organismic and Evolutionary Biology, University of Massachusetts at Amherst
2012–2014 Post-doctoral researcher, Center for Applied Mathematics, École Polytechnique, and Institut de Biologie, École Normale Supérieure (France)

KEY GRANTS AND FELLOWSHIPS

2020 NSF IOS-1942893. *CAREER: Macroevolutionary biomechanics: Integrating morphology, mechanical models, and phylogenetic comparative methods to understand the evolution of swimming performance in frogs*
2017 NSF DEB-1655812. *Collaborative Research: Understanding large-scale patterns of ecomorph evolution* (with John Wiens)
2014 Darwin Postdoctoral Fellowship, Organismal and Evolutionary Biology, Univ. Massachusetts at Amherst (fellowship and research funding)
2011 NSF DEB-1110704. *Dissertation Research: The role of history in adaptation to novel environments: the relationship between morphology, performance, and phylogenetic history in frogs* (co-PI)
2011 Smithsonian Predoctoral Fellowship, Smithsonian Institution
2010 Fulbright Student Grant to Colombia
2009 NSF OISE-0914012. East Asia and Pacific Summer Institutes (EAPSI) Fellow. *EAPSI: How does evolutionary history influence adaptation to a new environment? A study of the relationship between habitat, performance, morphology, and phylogeny in Chinese frogs* (PI)
2005 NSF Graduate Research Fellowship
2004 Graduate Council Fellowship, Stony Brook University
2002 Barry M. Goldwater Scholar

HONORS, AWARDS, AND SMALLER GRANTS

2020 Junior Faculty Award for Scholarly Excellence, College of Arts and Sciences, OSU
2017 Academic Summer Research Award, College of Arts and Sciences, OSU
2013 Investissement d'Avenir grant, ANR (Co-PI, French national research funding agency; CEBA: ANR-10-LABX-0025))
2012 King / Miller Travel Scholarship, Stony Brook University
2012 Graduate Student Excellence Award, Dept. Ecology & Evolution, Stony Brook University
2010 Best Teaching Assistant of the Year, Dept. Ecology & Evolution, Stony Brook University
2010 Lewis and Clark Fund, American Philosophical Society

2010 Tinker Field Research Grant for field research in Latin America
2005 Seibert Award for best student talk in evolution/systematics, Society for the Study of Amphibians and Reptiles, Annual Joint Meeting of Ichthyologists and Herpetologists

PUBLICATIONS (*Mentored Graduate Student; +Mentored Undergraduate)

Accepted/In press

1. **Moen, D. S.**, E. Cabrera-Guzmán, I. W. Caviedes-Solis, E. González-Bernal, and A. R. Hanna*. 2022. Phylogenetic analysis of adaptation in comparative physiology and biomechanics: overview and a case study of thermal physiology in treefrogs. *Journal of Experimental Biology*. **For special issue in February 2022: "Building new paradigms in comparative physiology and biomechanics". Accepted 7 October 2021 (available on request).

2. **Moen, D. S.** 2021. Improving inference and avoiding over-interpretation of hidden-state diversification models: specialized plant breeding has no effect on diversification in frogs. *Evolution*. Accepted 4 May 2021 (available on request).

3. **Moen, D. S.,** R. N. Ravelojaona*, C. R. Hutter, and J. J. Wiens. 2021. Testing for adaptive radiation: a new approach applied to Madagascar frogs. *Evolution*. In press. https://doi.org/10.1111/evo.14328.

Published

4. Prinzing, A., S. Pavoine, H. Jactel, J. Hortal, S. Hennekens, W. Ozinga, I. Bartish, M. Helmus, I. Kühn, **D. S. Moen**, E. Weiher, M. Braendle, M. Winter, C. Violle, P. Venail, O. Purschke, and B. Yguel. 2021. Disturbed habitats locally reduce the signal of deep evolutionary history in functional traits of plants. *New Phytologist* 232:1849–1862.

5. Kasoju, V. T., **D. S. Moen,** M. P. Ford, T. T. Ngo, and A. Santhanakrishnan. 2021. Interspecific variation in bristle number on forewings of tiny insects does not influence clap-and-fling aerodynamics. *Journal of Experimental Biology* 224:jeb239798.

6. Mendoza*, E., E. Azizi, and **D. S. Moen**. 2020. What explains vast differences in jumping power within a clade? Diversity, ecology, and evolution of anuran jumping power. *Functional Ecology* 34:1053–1063.
   **"Behind the paper" feature in the official blog of *Functional Ecology*

7. Juarez*, B. H., **D. S. Moen**, and D. C. Adams. 2020. A morphological method to approximate jumping performance in anurans for macroevolutionary studies. *Evolutionary Biology* 47:260–271.

8. Billaud, O., **D. S. Moen**, T. L. Parsons, and H. Morlon. 2020. Estimating diversity through time using molecular phylogenies: old and species-poor frog families are the remnants of a diverse past. *Systematic Biology* 69:363–383.

9. **Moen, D. S.** 2019. What determines the distinct morphology of species with a particular ecology? The roles of many-to-one mapping and trade-offs in the evolution of frog ecomorphology and performance. *American Naturalist* 194:E81–E95.

10. Kulyomina[+], J., **D. S. Moen**, and D. J. Irschick. 2019. Does habitat use predict body size and shape in geckos? *Journal of Morphology* 280:722–730.

11. **Moen, D. S.,** and J. J. Wiens. 2017. Microhabitat and climatic niche change explain patterns of diversification among frog families. *American Naturalist* 190:29–44.

12. Bars-Closel, M., T. Kohlsdorf, **D. S. Moen,** and J. J. Wiens. 2017. Diversification rates are more strongly related to microhabitat than climate in squamate reptiles (lizards and snakes). *Evolution* 71:2243–2261.

13. **Moen, D. S.,** H. Morlon, and J. J. Wiens. 2016. Testing convergence versus history: convergence dominates phenotypic evolution for over 150 million years in frogs. *Systematic Biology* 65:146–160.

14. Yguel, B., H. Jactel, I. S. Pearse, **D. S. Moen,** M. Winter, J. Hortal, M. R. Helmus, I. Kühn, S. Pavoine, O. Purschke, E. Weiher, C. Violle, W. Ozinga, M. Brändle, I. Bartish, and A. Prinzing. 2016. The evolutionary legacy of diversification predicts ecosystem function. *American Naturalist* 188:388–410.

15. **Moen, D. S.**, and H. Morlon. 2014. Why does diversification slow down? *Trends in Ecology and Evolution* 29:190–197.

16. **Moen, D. S.**, and H. Morlon. 2014. From dinosaurs to modern bird diversity: Extending the time-scale of adaptive radiation. *PLoS Biology*. 12:e1001854. (Invited commentary).

17. **Moen, D. S.**, D. J. Irschick, and J. J. Wiens. 2013. Evolutionary conservatism and convergence both lead to striking similarity in ecology, morphology, and performance across continents in frogs. *Proceedings of the Royal Society of London B* 280:20132156.

18. Wiens, J. J., R. A. Pyron, and **D. S. Moen**. 2011. Phylogenetic origins of local-scale diversity patterns and the causes of Amazonian megadiversity. *Ecology Letters* 14:643–652.

19. Wiens, J. J., C. A. Kuczynski, X. Hua, and **D. S. Moen**. 2010. An expanded phylogeny of treefrogs (Hylidae) based on nuclear and mitochondrial sequence data. *Molecular Phylogenetics and Evolution* 55:871–882.

20. **Moen, D. S.**, S. A. Smith, and J. J. Wiens. 2009. Community assembly through evolutionary diversification and dispersal in Middle American treefrogs. *Evolution* 63:3228–3247.
    **Third runner-up, Herpetologists' League Graduate Research Award (best talk at Annual Joint Meeting of Ichthyologists and Herpetologists)

21. **Moen, D. S.,** and J. J. Wiens. 2009. Phylogenetic evidence for competitively driven divergence: body-size evolution in Caribbean treefrogs (Hylidae: *Osteopilus*). *Evolution* 63:195–214.
    **Finalist, Ernst Mayr Award competition, best student paper award of the Society of Systematic Biologists
    **Cedar Brook Award for best talk at the departmental retreat, Dept. Ecology and Evolution, Stony Brook University

22. Wiens, J. J., and **D. S. Moen**. 2008. Missing data and the accuracy of Bayesian phylogenetics. *Journal of Systematics and Evolution* 46:307–314.
    **Outstanding Paper Award from journal (of papers published from 2008–2013)

23. **Moen, D. S.** 2006. Cope's rule in cryptodiran turtles: do the body sizes of extant species reflect a trend of phyletic size increase? *Journal of Evolutionary Biology* 19:1210–1221.

24. Wiens, J. J., C. H. Graham, **D. S. Moen**, S. A. Smith, and T. W. Reeder. 2006. Evolutionary and ecological causes of the latitudinal diversity gradient in hylid frogs: treefrog trees unearth the roots of high tropical diversity. *American Naturalist* 168:579–596.

25. **Moen, D. S.** and C. A. Stockwell. 2006. Specificity of the monogenean *Gyrodactylus tularosae*, Kritsky and Stockwell, 2005, to its natural host, the White Sands pupfish (*Cyprinodon tularosa*, Miller and Echelle 1975). *Comparative Parasitology* 73:278–281.

26. **Moen, D. S.**, C. T. Winne, and R. N. Reed. 2005. Habitat-mediated shifts and plasticity in the evaporative water loss rates of two congeneric pitvipers (Squamata, Viperidae, *Agkistrodon*). *Evolutionary Ecology Research* 7:759–766.

INVITED RESEARCH PRESENTATIONS

2020 Dept. Integrative Biology, Oklahoma State University (tenure seminar)
2019 Dept. Biology, University of Oklahoma
2019 Dept. Biological Sciences, Wichita State University
2019 Dept. Ecology, Evolution, and Organismal Biology, Iowa State University
2018 Estación Biológica de Doñana, CSIC, Sevilla, Spain
2018 Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional (CIIDIR) Oaxaca, Oaxaca City, México (given in Spanish)
2018 Dept. Anatomy, Oklahoma State University-Health Sciences Center
2017 Dept. Physiological Sciences, Oklahoma State University
2016 Dept. of Ecology and Evolutionary Biology, University of Arizona
2016 Biodiversity Institute and Natural History Museum, University of Kansas (Herpetology Lunch brown-bag seminar)
2016 Dept. Plant Biology, Ecology, and Evolutionary Biology, Oklahoma State University.
2015 Dept. Biological Science, University of Tulsa
2014 Instituto de Biología, Universidad Nacional Autónoma de México (given in Spanish)
2014 Dept. Zoology, Oklahoma State University
2014 Séminaire d'Ecologie, Systématique et Evolution, Orsay, France
2014 Séminaire Evolution et Diversité Biologique, Toulouse, France
2014 Graduate Program in Organismic and Evolutionary Biology, Univ. Massachusetts Amherst
2014 Graduate Program in Ecology, Evolutionary Biology, and Behavior, Michigan State University
2013 Séminaire d'Origine, Structure, et Evolution de la Biodiversité, Muséum Nationale d'Histoire Naturelle, Paris, France
2013 Oxford Brookes University, Oxford, United Kingdom
2013 Estación Biológica de Doñana, CSIC, Sevilla, Spain
2012 Chaire Modélisation Mathématique et Biodiversité, Muséum National d'Histoire Naturelle, Paris, France.
2012 California Academy of Sciences, San Francisco, CA
2011 Tropical Ecology Research Facility, University of Sydney, Northern Territory, Australia

2010 Universidad de Los Andes, Bogotá, Colombia
2009 Fudan University, Shanghai, China
2009 Kunming Institute of Zoology, Kunming, Yunnan, China

TEACHING EXPERIENCE

Oklahoma State University, Stillwater, OK, USA

Instructor, BIOL 4484/5484: Animal Locomotion (every two years in the fall; 4-credit graduate/upper-level undergraduate course with lab; typical enrollment 20 students; funds from CAREER award support undergraduate research in the class)

Instructor, BIOL 4184/5184: Herpetology (annually in the spring; 4-credit graduate/upper-level undergraduate course with lab; typical enrollment of 20 students)

Instructor, BIOL 4133: Evolution (most semesters from 2016–2019; 3-credit senior-level undergraduate course; typical enrollment of 70 students)

Instructor, BIOL 5010: Graduate Seminar, "Evolutionary Correlation and Regression" (Fall 2020; 1 credit; 5 students)

Prof. Development: edX, "The Inclusive STEM Teaching Project" (Oct.–Nov. 2021)

University of Massachusetts, Amherst, MA, USA

Instructor, Writing in Biology (Spring 2015; 3-credit undergraduate course; 30 students)

Instructor, Graduate Student Seminar Series (Spring 2015; 1-credit graduate course; 10 students)

Instructor, OEB Proseminar (Fall 2014; 1-credit graduate prof. develop. course; 7 students)

Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City, Mexico

Instructor, "A workshop on the relationship between trait evolution and species diversification, with a focus on the R package *diversitree*" (Oct. 2014; 3-day computer-based workshop; 25 participants)

La Universidad de Los Andes, Bogotá, Colombia

Co-Instructor, Historical Approaches in Biodiversity Studies (Spring 2011; 3-credit graduate course on phylogenetic comparative analysis; 18 students)

Stony Brook University, Stony Brook, NY, USA

Co-Instructor, How Science Works (Fall 2009; 3-credit course for non-science majors; 50 students)

Teaching Assistant, Biometry (Spring 2009; graduate course; **Best Teaching Assistant of the Year departmental award**)

Student writing tutor, NSF Alliances for Graduate Education and the Professoriate (2006–2010; lead instructor: 2008–2010)

Teaching Assistant, Herpetology (Spring 2006)

Teaching Assistant, Foundations of biology: organisms to ecosystems (Fall 2004)

RESEARCH MENTORSHIP

Post-doctoral researchers

Monique Simon (2021–present)
Gen Morinaga (2019–2021)
S. P. Vijayakumar (2017–2018)

Graduate students

Mitchell Aldridge (M.S.; thesis advisor; 2021–present)
Jack Spicer (M. S.; thesis advisor; 2018–2021)
Branly Soh (University of Dschang, Cameroon, M.S.; research mentor; 2018)
Rojo Ravelojaona (Université d'Antananarivo M.S.; research mentor; 2017–present)

Alison Hanna (M. S.; thesis advisor; 2016–2019)
Bryan Juarez (Iowa State University, Ph.D.; research mentor; 2016–2021)
Elizabeth Mendoza (M. S.; thesis advisor; 2016–2018)

Undergraduate students

Alex Fery (2020; REU fellow)
Connor Slattery (2020; REU fellow)
Megan Adler (2019–2020; research volunteer)
Hayden Dupire (2019; HHMI Life Sciences Freshman Research Scholar)
Andres Vargas (2019; REU fellow)
Steven Starr (2019; REU fellow)
Alexander Zakrzewicz (2019; Pre-service Teacher research mentorship)
Eleanor Shore (2019; research volunteer)
Alexis Butefish (2018–2019; HHMI Life Sciences Freshman Research Scholar)
Morgan Page (Fall 2018; research volunteer)
Antonio Loper (2017–2019; undergraduate honors thesis)
Baylee Rae (2017–2019; independent study, lab technician)
Mardi Wisdom (2017–2019; undergraduate honors thesis)
Colton Farmer (2017–2018; independent study)
Halee Brew (2017–2018; HHMI Life Sciences Freshman Research Scholar)
Loretta Lacy (2017–2018; HHMI Life Sciences Freshman Research Scholar)
Krista Thomas (2017–2018; research volunteer)
Madison Stevens (2017–2018; REU fellow and independent study)
Joseph Tucker (Fall 2017; research volunteer)
Kelsey Speer (all of 2017; undergraduate honors thesis)
Ulysses de la Rosa (2016–2017; research volunteer and independent study)
Dalton Hanson (2015–2017; independent study, lab technician)
Melissa Koehler (2016; NSF URM research scholar)
Kate Adams (2015–2016; HHMI Life Sciences Freshman Research Scholar)
Roy Cruz (2016; independent study)
Chris Williams (2016; independent study)
Marianne Caron (2015–2016; research volunteer, lab technician)
Elissa Brouwer (2015; HHMI Life Sciences Freshman Research Scholar)
Michelle Tran (2015; independent study)
Yuliya Kulyomina (01/2015–01/2019; independent study at Umass Amherst)
Meaghan Wheeler (12/2014–04/2016; independent study at Umass Amherst)
Lauren Malave (09/2009–05/2010; honors thesis at Stony Brook Univ.)

Ph. D. Committees

Ryan Sherman, Integrative Biology (2015–2019)
Ryan Shannon, Integrative Biology (2018–present)
Jay Walton, Integrative Biology (2018–present)
Vishwa Teja Kasoju, Mechanical and Aerospace Engineering (2018–present)
Mitchell Ford, Mechanical and Aerospace Engineering (2019–present)
Aintzane Santaquiteria Gil, University of Oklahoma Dept. Biology (2019–present)
Nathan Ong, OSU Center for Health Sciences, Paleontology Program (2020–present)
Nathan Taylor, Plant Biology, Ecology, and Evolution (2021–present)

M.S. Committees

Tyler Ryan, Integrative Biology (2017–2018)
Elizabeth Dawkins, Integrative Biology (2017–2019)
Rachael Brodsky, Integrative Biology (2020–present)

PROFESSIONAL AFFILIATIONS

American Society of Naturalists (2012–present)
Society for the Study of Reptiles and Amphibians (2002–present)
Society for the Study of Evolution (2003–present)
Society for Integrative and Comparative Biology (2016–present)
Society for Systematic Biologists (2004–present)

PROFESSIONAL SERVICE

Professional reviews

American Naturalist, Axios Reviews, Biology Letters, Caldasia, Ecography, Ecology Letters, Evolution, Evolutionary Ecology, Functional Ecology, Global Ecology and Biogeography, Journal of Biogeography, Journal of Evolutionary Biology, Journal of Heredity, Journal of Herpetology, Journal of Morphology, Journal of Zoology, Methods in Ecology and Evolution, Molecular Phylogenetics and Evolution, Nature Ecology and Evolution, Oecologia, Proceedings of the National Academy of Sciences of the United States, Proceedings of the Royal Society of London B., Systematic Biology

Editorial service

Board of Reviewing Editors, *Journal of Evolutionary Biology* (2018–present)

Proposal reviews

NSF DEB Evolutionary Ecology (2016)

Service to Oklahoma State University

College of Arts and Sciences Scholarship Committee (2018–present)
Judged posters at the Spring 2017 Graduate College research symposium
Judged research talks at the Spring 2016 OSU Graduate Research Symposium
OSU Interdepartmental workshop: Transitioning from student to faculty (panel member; 2016)

Service to OSU Dept. Integrative Biology

Departmental website design and maintenance (2020–present)
Interim Director of the Collection of Vertebrates (2020–present)
Animal Use committee (2020–present)
Technology committee (2017–2020; Chair 2019–2020)
Seminar committee (2015–2018; Chair 2017–2018)
Asst. Professor search committee (Fall 2017; Fall 2019)

Service to Professional Societies

"Ask an Expert" booth, Society for Integrative and Comparative Biology (SICB) Div. of Phylogenetic and Comparative Biology (SICB Annual Meeting 2019)
Wake Award student poster competition judge, SICB Div. of Phylogenetic and Comparative Biology (SICB Annual Meetings, 2017 and 2019)

Reviewer of scientific content

Educational film EVO: Ten Questions Everyone Should Ask about Evolution, by John Feldman (Hummingbird Films; http://www.hummingbirdfilms.com/evo.html)

Outreach talks

Oklahoma State University Science Café: "Why and how evolution repeats itself: studies of frogs and toads" (Stillwater, OK; 15 November 2016)
OSU Exotics Club: "Herpetology in Madagascar" (educational talk for 10 students; 29 March 2018)
OSU Student Chapter of the Wildlife Society: "Recognizing and handling venomous snakes in the wild" (Stillwater, OK; 2 October 2018)

OSU Exotics Club: "Doing international fieldwork (on frogs)" (educational talk for 15 students; 28 March 2019)
Institute of Environmental Sciences, Universidad de la Sierra Juárez, Oaxaca, Mexico: "On becoming a biologist" (educational talk for 45 undergraduate students; 8 August 2019)
Oklahoma State Science and Engineering Fair Teacher Workshop (16 secondary-school teachers, 12 October 2019; 7 teachers, 10 October 2020)

LANGUAGES

Computing: advanced **R**, intermediate MatLab, beginner *bash*
English: mother tongue
French: fluent speaking, reading, & writing
German: intermediate (but rusty) speaking, reading, & writing
Italian: beginner speaking & writing; intermediate understanding & reading
Mandarin Chinese: beginner (but rusty) speaking, reading, & writing
Spanish: fluent speaking, reading, & writing

RESEARCH SKILLS

Fieldwork experience

U.S.A.: 13 months in 14 states (AZ, CA, GA, MD, MN, MT, NC, ND, NM, NY, OK, SC, TX, VA)
International: 13.5 months in 9 countries (Australia, Cameroon, China, Colombia, Ecuador, France [French Guiana], Madagascar, Mexico, Spain).

Fieldwork skills

Aquatic sampling (seines, minnow traps, dip nets); terrestrial sampling (foot and road surveys, call tracking, drift fences, venomous snake handling); euthanization of fishes, amphibians, and reptiles; formalin/alcohol preservation

Labwork with live organisms

Quantification of jumping and swimming performance using high-speed video and force plates; muscle physiology; measurement of evaporative water loss; live maintenance

Data analysis

Experimental design, standard biostatistics, maximum likelihood and Bayesian modeling, phylogeny estimation, phylogenetic comparative methods, simulation modeling, multivariate statistics, geometric morphometrics of landmark data.