# Morgan W. Kelly

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## ACADEMIC AND RESEARCH APPOINTMENTS

2020-*pres* Associate Professor. Department of Biological Sciences, Louisiana State University.

2014- 2019. Assistant Professor. Department of Biological Sciences, Louisiana State University.

2011-2013 Postdoctoral Fellow. Department of Ecology, Evolution and Marine Biology, UC Santa Barbara Supervisor: Gretchen E. Hofmann.

2005-2006 Research Associate. Department of Molecular, Cellular, and Developmental Biology, University of Texas, Austin. Supervisor: Alan Lloyd.

## EDUCATION

2011 Ph.D. Population Biology Graduate Group, University of California, Davis. *Thermal tolerance and mating systems of two intertidal crustaceans.* Advisors: Eric Sanford and Richard Grosberg.

2004 M.S. Wildlife Ecology, University of Maine, Orono. *Conservation genetics of unionid mussels.* Advisor: Judith Rhymer.

1998 B.A. Biology, Swarthmore College, Swarthmore, PA.

## GRANTS AND AWARDS

2020 $139,789 "Identifying the physiological and molecular causes of elevated summer mortality in triploid oysters" Louisiana Sea Grant (2020-2022), **PI** (Co-PI J. LaPeyre).

2019 $2995 "Variation in the microbiome of the eastern oyster: environmental influences and effects on oyster health." Louisiana Sea Grant Undergraduate Opportunities program

2018 LSU Rainmaker Award: Emerging Scholar in Science, Technology, Engineering or Mathematics

2018 LSU Foundation Rising Faculty Research Award

2018 $491,138 (LSU portion) "Collaborative Research: Testing for local adaptation and responses to multiple stressors in populations of eastern oysters inhabiting a natural salinity gradient" *NSF, Biological Oceanography* 1737170 (2018-2021), **PI** (co-PIs J. La Peyre, J. Pollack).

2018 $499,607 "RCN: Evolution in Changing Seas" *NSF, Biological Oceanography* (1764316) **Co-PI** (Lead PI Katie Lotterhos, Northeastern University) (2018-2021).

2018 $62,565 (LSU Portion) supplement to 1737170 (2018), **PI** (co-PIs J. La Peyre, J. Pollack and J. Scarpa).

2017 $60,000 Alfred P. Sloan Foundation Fellow in Ocean Sciences.

2017 $9995 "Target capture sequencing to map the genetic basis of salinity tolerance in *Crassostrea virginica*" USDA-NRSP8, **PI** (Co-PI J. LaPeyre).

2017 $2500 "Epigenetic effects of salinity on eastern oyster *Crassostrea virginica*" Louisiana Sea Grant Undergraduate Opportunities program

2016 $159,666 Louisiana Sea Grant. Genomic variation and local adaptation among natural stocks of eastern oysters (*Crassostrea virginica*) in coastal Louisiana. (2016-2018), **PI** (co-PI J. La Peyre).

2016 Tiger Athletic Foundation Undergraduate Teaching Award.

2016 2016-17 Louisiana Discovery Integration and Application Fellow, *Louisiana Sea Grant.*

2017 $2500 "Local adaptation ot salinity in the eastern oyster *Crassostrea virginica*" Louisiana Sea Grant Undergraduate Opportunities program

2015 $140,125 The genomic basis of stress adaptation in a marine copepod. Louisiana Board of Regents. (2015-2018), **PI**.

2014 2014-2015 National Academies Education Fellow in Life Sciences.

## PUBLICATIONS

35. Griffiths, J. S., Y. Kawji and **Kelly, MW.** (2021) An Experimental Test of Adaptive Introgression in Locally Adapted Populations of Splash Pool Copepods**.** *Mol. Biol. Evol.* doi:10.1093/molbev/msaa289

34. Barley, J.M., Cheng, B.S., Sasaki, M., Gignoux-Wolfsohn, S., Hays, C.G., Putnam, A.B., Sheth, S., Villeneuve, A.R. & **Kelly, MW**. (2021) Limited plasticity in thermally tolerant ectotherm populations: evidence for a trade-off. *Proceedings of the Royal Society B: Biological Sciences*, 288.

33. Griffiths, J.S., Johnson, K.M., Sirovy, K.A., Yeats, M.S., Pan, F.T.C., La Peyre, J.F. & **Kelly, M.W**. (2021) Transgenerational plasticity and the capacity to adapt to low salinity in the eastern oyster, Crassostrea virginica. *Proceedings of the Royal Society B: Biological Sciences*, 288, 20203118.

32. **Kelly, M.W**. & Griffiths, J.S. (2021) Selection Experiments in the Sea: What Can Experimental Evolution Tell Us About How Marine Life Will Respond to Climate Change? *The Biological Bulletin*, 241, 0.

31. Marshall, D.A., Casas, S.M., Walton, W.C., Rikard, F.S., Palmer, T.A., Breaux, N., La Peyre, M.K., Beseres Pollack, J., **Kelly, MW.** & La Peyre, J.F. (2021) Divergence in salinity tolerance of northern Gulf of Mexico eastern oysters under field and laboratory exposure. *Conservation Physiology*, 9.

30. Marshall, D.A., Coxe, N.C., La Peyre, M.K., Walton, W.C., Rikard, F.S., Pollack, J.B., **Kelly, M.W**. & La Peyre, J.F. (2021) Tolerance of northern Gulf of Mexico eastern oysters to chronic warming at extreme salinities. *Journal of Thermal Biology*, 103072.

29. Sirovy, K. A., Johnson, K. M., Casas, S. M., La Peyre, J. F., & **Kelly, M. W**. (2021). Lack of genotype-by-environment interaction suggests limited potential for evolutionary changes in plasticity in the eastern oyster, Crassostrea virginica. *Molecular Ecology*.

28. Johnson, K. M., Jones, H. R., Casas, S. M., La Peyre, J. F., & **Kelly, M. W.** (2021). Transcriptomic signatures of temperature adaptation in the eastern oyster Crassostrea virginica. *Journal of Evolutionary Biology*.

27. Griffiths, J. S., Johnson, K. M., & **Kelly, M. W.** (2021). Evolutionary Change in the Eastern Oyster, Crassostrea Virginica, Following Low Salinity Exposure. *Integrative and Comparative Biology*.

26. Johnson, KM, & **Kelly, MW** (2020). Population epigenetic divergence exceeds genetic divergence in the Eastern oyster Crassostrea virginica in the Northern Gulf of Mexico. *Evolutionary Applications*.

25. Johnson, KM, Sirovy, KA, Casas, SM, La Peyre, JF, & **Kelly, MW** (2020) Characterizing the epigenetic and transcriptomic responses to Perkinsus marinus infection in the eastern oyster Crassostrea virginica. *Frontiers in Marine Science*.

24**. Kelly, MW** (2019) Adaptation to climate change through genetic accommodation and assimilation of plastic phenotypes. *Philosphical Transactions of the Royal Society, B.*

23. Jones, HR, Johnson, KM, **& Kelly, MW** (2019). Synergistic effects of temperature and salinity on the gene expression and physiology of Crassostrea virginica. *Integrative and comparative biology*, *59*(2), 306-319.

22. Griffiths JS, Pan TCP, **Kelly MW (**2019) Differential responses to ocean acidification between *Balanophyllia elegans* populations from two different upwelling environments[§]. *Molecular Ecology*. [§]*From the cover*

21. DeBiasse, MB, Kawji, Y*, and **Kelly, MW.** (2018). Parallel phenotypic and transcriptomic response to salinity stress across *Tigriopus californicus* populations separated by 1000 kilometers. *Molecular Ecology* 27 (7) 1621-1632 **undergraduate co-author*

20. Rivest, EB, **Kelly, MW**, DeBiasse, MB, Hofmann, GE. (2018) Host and Symbiont Compartments in *Pocillopora damicornis* Larvae Display Different Transcriptomic Responses to Ocean Acidification and Warming. *Frontiers in Marine Science*. 5: 186.

19. Wong, JM, Johnson, KM, **Kelly, MW,** and Hofmann, GE. (2018) Transcriptomics reveal transgenerational effects inpurple sea urchins exposed to upwelling conditions, and the response of their progeny to differential $pCO_2$ levels. *Molecular Ecology* 27 (5) 1120-1137.

18. Saltz, JB, Kelly, Hessel, FC*, **Kelly, MW.** (2017) Trait correlations in the genomics era. *Trends in Ecology and Evolution.* 32 (4), 279-290 **undergraduate co-author*

17. **Kelly, MW,** Pankey, MS, DeBiasse, MB, Plachetzki, DP. (2017) Adaptation to heat stress reduces phenotypic and gene expression plasticity in a marine copepod. *Functional Ecology.* 31: 398-406

16. **Kelly, MW,** DeBiasse, MB., Cecola*, C. Roberts*, H, & Villela*, V. (2016) Adaptation to climate change: trade-offs among responses to multiple stressors in an intertidal crustacean. *Evolutionary Applications.* 9:1147-1155. * *undergraduate co-author*

15. Padilla-Gamino, JL, Gaitan-Espitia, JD, **Kelly, MW,** Hofmann, GE (2016) Physiological plasticity and local adaptation to ocean acidification in the calcareous algae *Corallina vancouveriensis*: An ontogenetic and geographic approach. *Evolutionary Applications.* 9:1043-1053

14. DeBiasse, MB., & **Kelly, MW**. (2016) Plastic and evolved responses to global change: what can we learn from comparative transcriptomics? *Journal of Heredity.* 107:71-81.

13. **Kelly, MW.,** Padilla-Gamiño, JL., Hofmann, G.E. (2015) High $pCO_2$ affects body size, but not gene expression in larvae of the California mussel, (*Mytilus californianus*). *ICES JMS.* fsv 184.

12. Evans, TG, Diamond, SE, **Kelly, MW**. (2015) Mechanistic species distribution modeling as a link between physiology and conservation. *Conservation Physiology.* 3,1. cov056

11. TG Evans, JL Padilla-Gamiño, **MW Kelly**, et. al. (2015) Ocean acidification in the 'post-genomics era: Roadmaps from the purple sea urchin *Strongylocentrotus purpuratus. Comparative Biochemistry and Physiology Part A.* 185:33-42

10. Hofmann GE, Evans TG, **Kelly MW**, Padilla-Gamino JL, Blanchette CA, Washburn L, Chan F, McManus MA, Menge BA, Gaylord B, Hill TM, Sanford E, LaVigne M Rose JM, Kapsenberg L, and Dutton JM. (2014) Exploring local adaptation and the ocean acidification seascape – studies in the California Current Large Marine Ecosystem. *Biogeosciences* 11:1053-1064.

9. **Kelly MW**, Padilla-Gamiño, JL, Hofmann, GE. (2013) Natural variation and the capacity to adapt to ocean acidification in a keystone species. *Global Change Biology* 19:2536-2546.

8. Padilla-Gamiño, JL, **Kelly, MW**, Evans, TE and Hofmann, GE. (2013) Temperature and $CO_2$ additively regulate physiology, morphology and genomic responses of larval sea urchins, *Strongylocentrotus purpuratus. Proceedings of the Royal Society, B.* 280:1759.

7. **Kelly MW**, Sanford E, Grosberg RK. (2013) Trade-offs, geography, and limits to thermal adaptation in the tidepool copepod *Tigriopus californicus. American Naturalist.* 181:846-854.

6. **Kelly MW**, Hofmann GE. (2012) Adaptation and the physiology of ocean acidification. *Funct. Ecol.*27: 980-990.

5. **Kelly MW**, Grosberg RK. Sanford E. (2012) Love the one you're with: proximity determines mating success in the barnacle *Tetraclita rubescens. Molecular Ecology.* 21: 5088–5097.

4. **Kelly MW**, Sanford E, Grosberg RK. (2012) Limited potential for adaptation to climate change in a tidepool copepod. *Proceedings of the Royal Society, B.* 279: 349–356.

3. Sanford E, & **Kelly MW**. (2011) Local adaptation in marine invertebrates. *Annual Review of Mar. Sci.* 3: 509-535.

2. **Kelly MW**, Sanford E. (2010) The Evolution of mating systems in barnacles. *Journal of Experimental Marine Biology and Ecology.* 392: 37-45.

1. **Kelly MW**, Rhymer JM (2005). Population genetic structure of a rare unionid (*Lampsilis cariosa*) in a recently glaciated landscape. *Conservation Genetics.* 6: 789-802.

*Manuscripts in review or advance stages of preparation*

Debiasse MB, Stubler AD, & **Kelly MW** Testing the effect of ocean acidification on a sponge-coral species interaction. (*in prep)*

*Conference Proceedings*

Debiasse, M. B., Stubler, A. D., & **Kelly, M. W**. (2017). Testing the effect of ocean acidification on a sponge-coral species interaction. *Integrative and Comparative Biology.* 57: E241.

Griffiths, J. S., **Kelly, M. W**., & Hellberg, M. E. (2017). Investigating Latitudinal Shifts in Allele Frequencies Over 20 Years in the Coral Balanophyllia elegans. *Integrative and Comparative Biology*. 57:E64.

**Kelly, M. W**., & Yoon, A. (2017). Protein coding and regulatory variation contribute to heat adaptation in the copepod Tigriopus californicus. *Integrative and Comparative Biology*. 57: E310.

Riley, S. M., **Kelly, M. W**., La Peyre, M. K., & La Peyre, J. F. (2017). Using Next Generation Sequencing to Identify Local Adaptation to Salinity in the American Oyster, Crassostrea virginica, on the Louisiana Gulf Coast. *Integrative and Comparative Biology*. 57:E140.

Griffiths, J. S., **Kelly, M. W**., & Hellberg, M. E. (2017). Intraspecific Variation in the Response of the Coral, Balanophyllia elegans, to Future Ocean Acidification. *Integrative and Comparative Biology*. 57:E279

**Kelly, M. W**., Pankey, S., Debiasse, M. B., & Plachetzki, D. (2016). Adaptation to heat stress reduces phenotypic and gene expression plasticity in a marine copepod. *Integrative and Comparative Biology*. 56:E108.

**Kelly, M. W.,** Padilla-Gamino, J. L., & Hofmann, G. E. (2013). Natural variation, and the capacity to adapt to ocean acidification in the sea urchin *Strongylocentrotus purpuratus. Integrative and Comparative Biology* 53: E108.

Padilla-Gamino, J. L., **Kelly, M. W**., Evans, T. G., & Hofmann, G. E. (2013). Multiple climate change variables interact to reduce the physiological performance of sea urchin larvae in future oceans. *Integrative and Comparative Biology*. 53:E160.

## MENTORSHIP

*Theses directed*

Rujuta Vaidya (2020- ) Ph.D. student
Wissam Jawad (2020- ) Ph.D. student
Heather Smith (2019- ) M.S. student "Intraspecific variationin hypoxia and disease tolerance in eastern oyters"
Hollis Jones, (2016- 2018) M.S. student "Synergistic effects of heat and low salinity stress on eastern oyters"
Kyle Sirovy (2017- ) Ph.D. student "Effects of Changing Salinity and Temperature on the Blue Mussel *Mytilus edulis"*
Joanna Griffiths, PhD (2014-2020) "Investigating evolutionary responses to past, current, and future ocean change in marine invertebrates"
Devin Comba undergraduate honors thesis (2019)
Yasmeen Kawjii undergraduate honors thesis (2020)
Megan Guidry undergraduate honors thesis (2020)
Angela Yoon, undergraduate honors thesis (2017) "qPCR amplification of Heat Shock Protein 70 in *Tigriopus californicus*"
Ellen Foster, undergraduate honors thesis (2016) "The Effects of Mitochondrial DNA on the Fitness of a Marine Crustacean"

*Postdoctoral Mentees*

Dr. Kevin Johnson (2017-2020 )
Dr. Melissa DeBiasse (2014-2016)

*Graduate Committees:*

David Vander Pluym—Ph.D. advisee of Nick Mason Dept of Biological Sciences (2021-)
Austin Chips—Ph.D. advisee of Jake Esselstyn Dept of Biological Sciences (2021-)
Maggie Vincent —Ph.D. advisee of Kyle Harms, Dept of Biological Sciences (2021-)
Evatt Chirgwin—Ph.D. advisee of Dr. Keyne Monroe, Monash University (2019)
Janet Mansaray—Ph.D. advisee of Laura Lagomarsino, Dept of Biological Sciences (2019-)
Roberta Canton—Ph.D. advisee of Brant Faircloth, Dept of Biological Sciences (2019-)
Jamie Phelps—Ph.D. advisee of Kyle Harms, Dept of Biological Sciences (2019-)
Scott Grimmell--Ph.D. advisee of Bret Eldred, Dept of Biological Sciences (2019-)
Alexander Ventura –Ph.D. advisee of Sam Dupont, Department of Biological and Environmental Sciences, University of Gothenburg, Sweden (thesis opponent, 2018).
Luis Santiago-Rosario—Ph.D. advisee of Kyle Harms, Dept of Biological Sciences (2018-)

Ali Mehrnezhad--Ph.D. advisee Kidong Park, School of Electrical Engineering and Computer Sci, Dean's representative (2017-2019)
Juliet Wong – Ph.D. advisee of Gretchen Hofmann, UC Santa Barbara, (2016)
Jessie Salter – Ph.D. advisee of Brant Faircloth, Dept. of Biological Sciences (2016- )
Alicia Reigel -- Ph.D. advisee of Michael Hellberg, Dept. of Biological Sciences (2016- 2020)
Joanna Miketinas –Masters of Natural Science (2015)
Kayla Daigle -- Masters of Natural Science (2015)
Maria Vozzo -- M.S. advisee of Kenneth Brown, Dept. of Biological Sciences (2014)
Carlos Prada -- Ph.D. advisee of Michael Hellberg, Dept. of Biological Sciences (2014)
Mark Duhon -- Ph.D. advisee of Michael Hellberg, Dept. of Biological Sciences (2014-2020)

*Undergraduate committees*

Aniko Nowakowski Honors Thesis committee (2020)
Mike Le Honors Thesis committee (2019)
Florencia Scaglia Drusini, Honors Thesis committee (2017)

## TEACHING

**Instructor.** Louisiana State University.

*Introduction to Evolution* (Biol 3040). Sp 2014, Sp 2015, F 2015, Sp 2016, F 2016, S 2018, F2018 F2019, Sp 2020, Sp 2021

*Evolution in the Wild* (Biol 7800), a graduate course in Evolutionary Ecology. Sp 2017, Sp 2019, Fall 2020

**Instructor.** Friday Harbor Laboratories. Evolutionary Responses to Climate Change in the Sea. Su 2016.

## INVITED TALKS (*last 5 years*)

2019 University of North Carolina, Chapel Hill "What doesn't bend: responses to environmental heterogeneity in two marine invertebrates."

2019 University of Rhode Island "What doesn't bend: responses to environmental heterogeneity in two marine invertebrates."

2019 University of Georgia"What doesn't bend: responses to environmental heterogeneity in two marine invertebrates."

2019 Society for Integrative Biology Symposium on Stress and Fitness: "What doesn't bend: Environmentally responsive gene expression and measures of fitness in natural populations of the eastern oyster, *Crassostrea virginica*

2018 "Capacitors and Constraints on Evolutionary Responses to Global Change" Gordon Research Conference in Ocean Global Change Biology. Waterville Valley, NH.

2017 "The Price of Victory: Limits to stress adaptation in marine invertebrates." Department of Ecology and Evolution Seminar, University of Chicago, Chicago, IL.

2017 American Society of Naturalists Symposium on Niche Breadth Evolution: "Adaptive evolution and the nested niche. Copepod thermal tolerance and evolutionary potential in the face of warming waters" Society for the Study of Evolution Annual Meeting, Portland, OR

2017 "The Price of Victory: Limits to stress adaptation in marine invertebrates." Department of Biological Sciences Seminar, University of Alabama, Tuscaloosa, AL.

2017 "The Price of Victory: Limits to stress adaptation in marine invertebrates." Department of Biological Sciences Seminar, Southeastern Louisiana University, Hammond, LA.

2016 **Keynote Address:** "Does environmental history influence a species' vulnerability to ocean change?" Gordon Research Seminar in Ocean Global Change Biology. Waterville Valley, NH.

2016 "Stress tolerance and responses to climate change." Swarthmore College, Swarthmore, PA.

2016 "Stress adaptation in marine invertebrates." Friday Harbor Research Labs, University of WA

2016 "The price of victory: consequences of stress adaptation in marine invertebrates." LSU Museum of Natural Science

2015 "Trade-offs and the evolution of stress tolerance in marine invertebrates" University of Louisiana Lafayette

2015 "Trade-offs and the evolution of stress tolerance in marine invertebrates" Rice University, Houston,

TX

2014 "Trade-offs and the evolution of stress tolerance in marine invertebrates" University of Southern California, Marine and Environmental Biology, Los Angeles, CA

2014 "Trade-offs and the evolution of stress tolerance in marine invertebrates" Hopkins Marine Station, Monterey, CA

2014 American Physiology Society Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology. Speaker and Symposium co-organizer "Acclimate, Adapt or Die: Responses to Global Change." San Diego, CA

2014 American Genetic Association Symposium on Evolution and Plasticity: Adaptive responses by species to human-mediated changes to their ecosystems. Seattle, WA

2014 Louisiana State University, Department of Renewable Natural Resources. Baton Rouge, LA

2014 University of New Orleans, Department of Biological Sciences. New Orleans, LA

## SERVICE

**Faculty and Student recruitment**

- Member of Faculty Search Committee "Microbiologist" (2019-2020)
- Member of Faculty Search Committee "Integrative Physiologist" Department of Biological Sciences
  (2016-2017), (2017-2018)
- Destination LSU Mock lectures. Delivered mock lecture to prospective undergraduate students during recruitment event for the College of Biological Sciences (2018-2019)
- College of Biological Sciences tours: met with prospective College of Sciences undergraduates and their families on weekly lab tours (2017-2019)
- Faculty-Student Social, organized as a part of departmental graduate student recruitment weekend (2016, 2017, 2018, 2019, 2020, 2021)

**Departmental Service**

- Systematics Evolution and Ecology Section Representative to the Executive Committee (2018- )
- Member of Tenure Mentoring Committee for Laura Lagomarsino (2020- ), and member o Teaching committee for Christine Lattin (2019- ), Adam Bohnert (chair) (2019- ) and Nick Mason (2021-)
- Diversity, Equity and Inclusion Committee chair (2020- )

**University Service**

- Member of the Faculty Senate advisory committee on LSU libraries (2019 - )

**Journal Editorial Boards**

- *Oikos:* Subject Editor (2017-2020 )
- *Journal of Experimental Marine Biology and Ecology:* Editorial Board Member (2017-2020 )

**Reviewer/Panelist**

Manuscripts

2020: *Molecular Biology and Evolution (2) Molecular Ecology (2), Marine Ecology Progress Series*
2019: *Conservation Physiology, Molecular Ecology (2), Evolution*
2018: *Molecular Ecology Resources, Molecular Ecology, Philosophical Transactions of the Royal Society B, Nature Ecology and Evolution, Journal of Experimental Biology, Journal of Experimental Marine Biology and Ecology*
2017: *American Naturalist, Journal of Heredity, Nature Communications, Nature Ecology and Evolution, Molecular Ecology, BMC Genomics, Journal of Experimental Marine Biology and Ecology*
2016: *Ecology Letters, Science Advances*
2015: *Axios, Journal of Heredity, Marine Biology, Molecular Ecology*
2014: *Climate Change Responses, Ecology, Molecular Ecology, PLOS Genetics, Proceedings of the Royal Society B,*

Proposals

2020: Panelist, NSF Integrative Organismal Systems
Ad-hoc reviewer, NSF Biological Oceanography
2019: Panelist, NSF Enabling Discovery Through Genomic Tools

Ad-hoc reviewer, NSF Biological Oceanography, IOS, Connecticut Sea Grant, Rhode Island Sea Grant

2018: Panelist, NSF, Biological Oceanography
LSU Discover – reviewed student research proposals for summer fundin

ad-hoc reviews: NSF-DEB (1), Biological Oceanography (2)

2017: ad hoc reviews, Sigma Xi, LSU chapter, Connecticut Sea Grant, NSF-Office of Polar Programs, NSF Biological Oceanography

2016: Panelist, NSF Integrative Organismal Systems

2016: ad hoc, NSF Biological Oceanography (2)

2015: The New University Researchers Start-up Program of Fonds de recherche du Québec – Nature et technologies (FRQNT), Oregon Sea Grant

2014: ad hoc, NSF Biological Oceanography (2)

**Undergraduate Mentorship** 30 undergraduate research assistants mentored for one or more semesters, three publications and two posters co-authored with undergraduates; one received best poster award at the LSU undergraduate research conference.

## PROFESSIONAL MEMBERSHIPS

Society for Integrative and Comparative Biology, American Society of Naturalists, Western Society of Naturalists, Society for the Study of Evolution