

**CURRICULUM VITAE
JAMES PAUL COLLINS**

ADDRESS

Arizona State University
School of Life Sciences
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EDUCATION

<u>Institution</u>	<u>Degree</u>	<u>Year Granted</u>
Manhattan College	B.S.	1969
University of Michigan	M.S.	1971
University of Michigan	Ph.D.	1975

AREA OF SPECIALIZATION AND INTEREST

Ecology/Evolution. - Host-pathogen biology and the global decline of amphibians; evolution of life history characters and patterns of morphological variation; intellectual and institutional factors that have shaped the development of ecology as a science; ecological ethics

PROFESSIONAL EMPLOYMENT

<u>Employer</u>	<u>Title or Rank</u>	<u>Year</u>
Arizona State University	Assistant Professor	1975-80
Arizona State University	Associate Professor	1980-1990
Arizona State University	Professor	1990- present
National Science Foundation	Director, Population Biology and Physiological Ecology Program	1985-1986
Arizona State University	Chairman, Zoology Department	1989-1997
Arizona State University	Chairman, Biology Department	1997-2002
Arizona State University	Virginia M. Ullman Professor of Natural History and the Environment	2000- present
National Science Foundation	Assistant Director for Biological Sciences	2005- 2009

AFFILIATED FACULTY MEMBERSHIP

ASU

Center for the Study of Law, Science, and Technology
Center for Biology and Society
Consortium for Science and Policy Outcomes, Affiliated Scholar
Global Institute of Sustainability, Senior Sustainability Scientist
Program in Computational Biosciences
Environmental Life Sciences Faculty

Marine Biological Laboratory, Woods Hole, MA

Adjunct Senior Scientist

HONORS

Fellow, American Association for the Advancement of Science (1986)
Irving S. Cooper Visiting Professor and Lecturer, Mayo Clinic/Scottsdale (1999)
Pettingill Lecturer in Natural History, The University of Michigan Biological Station (2000)
Virginia M. Ullman Professor of Natural History and the Environment (2000)
Thomas Hall Memorial Lecturer, Washington University, St. Louis (2000)
Bonchek Fellow, Franklin and Marshall College, Bonchek Institute for Science and Public
Policy (2002)

Distinguished Faculty Award, College of Liberal Arts and Sciences, Arizona State University (2003)

Gary Krahenbuhl Difference Maker Award, College of Liberal Arts and Sciences, Arizona State University (2005)

Fellow, Association for Women in Science (2006)

Perspectives of Science Leaders Address, American Society of Plant Biology (2007)

Kaeser Visiting Scholar, University of Wisconsin, Madison (2009)

Distinguished Lecturer in Life Science, Huck Institutes of the Life Sciences, Penn State University (2010)

President's Science Symposium Address, Bowdoin College (2011)

President, American Institute of Biological Sciences [AIBS] (2011)

Phi Beta Kappa Lifo Amundson Lecture, University of South Dakota (2012)

PROFESSIONAL PARTICIPATION

Membership in Professional Associations

American Association for the Advancement of Science; American Institute of Biological Sciences; Ecological Society of America; Society for the Study of Evolution; American Society of Ichthyologists and Herpetologists; Scientific Research Society of North America (Sigma Xi); American Society of Naturalists; International Society for the History, Philosophy and Social Studies of Biology; Association for Women in Science; Marine Biological Laboratory Corporation

Advisory Board Memberships

Board of Directors, American Institute of Biological Sciences (2010, 2011 [Chairman], 2012-present)

Board of Directors, American Association of Colleges and Universities (2011-present)

Board of Directors, Biofrontiers Institute, University of Colorado-Boulder (2011-present)

Board of Directors, National Ecological Observatory Network (2011-present [Chairman])

Board of Delegates, Oxford University Press (2008-present)

Committee on Science, Engineering, and Public Policy, American Association for the Advancement of Science (AAAS) (2013-present)

Advisory Board, IQ Biology—Interdisciplinary Quantitative Biology, University of Colorado-Boulder (2011-present)

Advisory Board, National Geographic Society “FieldScope: Collaborative Mapping for Education” Project (2011-present)

Science Advisory Board for Tropical Ecology Assessment and Monitoring (TEAM) Network, Conservation International (2007-present)

Scientific Advisory Committee, History and Philosophy of Science, Marine Biological Laboratory (2009-2011)

Advisory Council to the National Institutes of Health National Center for Research Resources [NCRR] (2007-2009)

Advisory Committee to the Assistant Director of the National Science Foundation for Biological Sciences (1998- 2004; Chair 2002-2004)

Advisory Committee for Environmental Research and Education, Assistant Director of the National Science Foundation for Geological Sciences (2000-2004; Convenor 2000-2001).

Chairman, Board of Directors, Declining Amphibian Populations Task Force (2003-2006)

Chairman, U.S. National Science and Technology Council's Committee on Science Subcommittee on Biotechnology (2005-2009)

U.S. National Science and Technology Council's Committee on Homeland and National Security Subcommittee on Foreign Animal Disease Threats (2005-2009)

Co-Chair, U.S. National Science and Technology Council's Committee on Science Interagency Working Group on Plant Genomes (2005-2009)

U.S. National Science and Technology Council's Committee on Science Interagency Working Group on Scientific Collections (2005-2009)

U.S. National Science and Technology Council's Committee on Natural Resources Subcommittee for the U.S. Group on Earth Observations (2007-2009)

Service to Professional Organizations

U.S. National Academy of Sciences National Research Council committee on *Thinking Evolutionarily: Making Biology Education Make Sense* (2011)

Principal NSF contact to US Group on Earth Observations [USGEO] (2006-2009)

Consultant to the Office of the Director of the National Science Foundation (2009-2010)

Co-Chair, Organizing Committee for the Amphibian Action Plan Summit, Conservation International, Washington, D.C. (2005)

Co-Chair, International Union for the Conservation of Nature, Species Survival Commission Amphibian Specialist Group (2005-2011)

Historical Records Committee, Ecological Society of America (1983-88)

George Mercer Award Committee, Ecological Society of America (1987-1988)

Young Investigator Awards Committee (Chairman), American Society of Naturalists (1987-1988)

Community Service

The Arizona Arts, Sciences and Technology Academy: Founding Fellow; Board of Governors (2004-2005)

Southwest Center for Education and the Natural Environment: President (1994-95); Secretary (1993-94); Treasurer (1991-93); member, Board of Directors (1991-present)

Arizona State Parks Board Natural Areas Program Advisory Committee Vice Chair (2000-2004); Committee member (2000-2004)

Mesa (Arizona) Southwest Museum: member, search committee for director (2001)

Peer Review Activities

Member, Board of Editors, *Evolution* [The Society for the Study of Evolution] (1995-1998)

Member, Board of Editors, *Ecology* and *Ecological Monographs* [Ecological Society of America] (1990-93)

Member, National Science Foundation's Graduate Research Fellowship Program review panel (2013)

External reviewer for proposed MS and MA programs in Urban Ecology, Office of the Provost, Hofstra University (2011)

Member, External review team for the Department of Ecology and Evolution, State University of New York at Stony Brook (2005)

Member, External review team for the Department of Zoology, Oklahoma State University (2005)

Ad hoc Review Committee, Office of the President, Harvard University (2004)

External reviewer for the Department of Zoology, University of Oklahoma (2004)

Member/Chair, External review team for Department of Ecology, Evolution, and Natural Resources, Rutgers University (2003)

Member, National Science Foundation's Committee of Visitor's for oversight review of the Ecological Studies Cluster, Division of Environmental Biology (2002).

Member, External review team for Department of Zoology, Miami University/Ohio (2001)

Member, Protocol Evaluation Panel for Cultural Resources of the Grand Canyon, Grand Canyon Research and Monitoring Center and the Bureau of Reclamation (2000)

Member, National Science Foundation's Committee of Visitor's for oversight review of the Developmental Mechanisms Cluster, Division of Integrative Biology and Neuroscience (2000)

Member, National Science Foundation's Committee of Visitor's for oversight review of the Division of Environmental Biology (1999)

Member, External review team for Department of Biological Sciences, Florida State University (1999)

Member (Chairman) NSF Population Biology Program's "Population Biology Task Force" (1998)

Member, National Science Foundation's Site Visit Review Teams for Research Training Grants in Ecology (1997)

Member, National Science Foundation's Advisory Panel for Postdoctoral and Professional Development Awards in Science, Technology and Society Program [Research in History, Social Studies, and Philosophy of Science and Technology] (1991)

Member (Chairman), National Science Foundation's Committee of Visitor's for oversight review of the Ecological Studies Cluster (1992)

Member, National Science Foundation's Advisory Panel for Research Training Grants Program (1993, 1989)

Member, National Science Foundation's Site Visit Review Panel for Research Training Grant site in Ecological Economics (1990)

Member, Environmental Protection Agency's Advisory Panel for Environmental Monitoring and Assessment Program (EMAP) [Desert and Rangelands] (1989)

Member, National Science Foundation's Expert Panel in Systematic Biology to evaluate the use of morphometrics for research in evolutionary biology (1989)

Member, National Science Foundation's Site Visit Review Panel for Science and Technology Center in Mathematical Biology (1988)

Member, National Science Foundation's Advisory Panel for Research Experiences for Undergraduates Program (1988)

Member, National Science Foundation's Population Biology and Physiological Ecology Program Advisory Panel (1984-1985)

Review of grant proposals for Bureau of Reclamation, European Science Foundation, Natural Sciences and Engineering Research Council of Canada, National Science Foundation (Panels = Population Biology; Ecology; Systematics; Regulatory Biology; Division of International Programs; History and Philosophy of Science), USDA Forest Service, US Geological Survey Amphibian Research and Monitoring Initiative.

Pre-publication review of manuscripts for American Naturalist, American Midland Naturalist, Animal Conservation, Behavioral Ecology, Biology and Philosophy, Biological Invasions, Biological Conservation, Biotropica, Canadian Journal of Zoology, Copeia, Conservation Biology, Ecology, Ecology Letters, Ecological Monographs, Environmental Science and Technology, Evolution, Frontiers in Ecology and the environment, Herpetologica, Herpetological Journal, Highlights for Children, Journal of Animal Ecology, Journal of Herpetology, Journal of the History of Biology, Physiological Zoology, Proceedings of the National Academy of Sciences (USA), Proceedings of the Royal Society B Biological Sciences, Quarterly Review of Biology, Science, Systematic Biology, The National Academies (USA), Trends in Ecology and Evolution, Western North American Naturalist

COURSES TAUGHT

Undergraduate: Fundamentals of Ecology; Introduction to Subtropical Marine Biology (field course in the Bahamas); Marine Biology; Evolution: Historical and Philosophical Perspectives; Organic Evolution; Introductory Biology; Life Sciences Career Paths.

Undergraduate/Graduate: Biometry; Professional Values in Science.

Graduate: Populations: Evolutionary Ecology; Quantitative Ecology; various seminars.

SERVICE

School of Life Sciences

Faculty Leader; Ecology, Evolution, and Environmental Sciences	2003 - 2005; 2009-present
Executive Committee	
Search Committee, Manager of Undergraduate Programs	2003 - 2005; 2009-present
Bioethics Search Committee	2003
Search Committee (Chair), Ecology of Infectious Diseases	2003 - 2004; 2010
Planning Committee	2003 - 2004

Departmental Committees

Search Committee for Wildlife Biologist	1975-1976, 1980-1981
Graduate Admissions Committee	1976-1977
Advisory Committee	1976-1978, 1982-83, 1986
Advisory Committee (Chairman)	1987-1988
Search Committee for Maytag Professorship	1976-1977, 1979-1980
Search Committee for Maytag Professorship (Chairman)	1984-1985
Ecology Seminar Committee (Co-chairman)	1976-80, 1984-85, 1987-88
Graduate Research Committee	1977-1978
Graduate Research (Chairman)	1979-81, 1984-85, 1986-90
Computer Services Representative	1977-1981
Ecology Search Committee	1977-1978, 1979-1980
Zoology Department Seminar Committee	1978-1979
Zoology Department Seminar Committee (Co-chairman)	1980-1981
Zoology Department Honors Committee	1978-1981
Ecology Area Sub-Committee (Chairman)	1979-1983, 1986-1990
Systematics Area Sub-Committee (Chairman)	1984-1985
Graduate Student Review Committee	1980-1981
Graduate Student Review Committee (Chairman)	1982-1983
Zoology Department Personnel Committee	1981-1982, 1984-1985
Physiological Ecologist Search Committee (Chairman)	1981-1982
Zoology Department Affirmative Action Committee	1982-1983
Graduate Programs Committee	1986-1990
Graduate Programs Director	1988-1990
Departmental Collections Advisory Committee	1987-1989
Evolutionary Geneticist Search Committee	1987-1988

University Committees

Ad hoc Committee on Interdisciplinary Ecology Program	1979-1981
Ad hoc Committee on Undergraduate Humanities Program	1982
Committee on Graduate Program in Humanities	1982-1983
Committee on Humanities - Interdisciplinary Humanities Program	1984-1985
Search Committee for Chair, Zoology Department (Chair)	1984-1985
Ad hoc Committee for Animal Care Facilities Renovation	1986-1987

College of Liberal Arts and Sciences Research Awards Committee	1987-1988
Search Committee for Associate Dean, College of Liberal Arts and Sciences	1988-1989
Search Committee for Vice President for Research, Provost's Office	1991-1992
Life Sciences Task Force, ASU-West	1991-1992
ASU-East Planning Committee, Provost's Office	1992-1993
University Council on Health Professions Education, Arizona Board of Regents	1994-1995
Environmental Studies Committee (Chair), Provost's Office	1994-1995
Search Committee for Development Officers, College of Liberal Arts and Sciences	1993-94
Academic/Research Steering Committee for ASU Aquarium Project (Chairman), Provost's Office	1994-95
Ad hoc Committee on Health Professions Education, President's Office	1995
Biological Sciences Planning Committee, College of Liberal Arts and Sciences	1994-95
Faculty Advisory Committee for the Center for Environmental Studies	1998-2000
Strategic Planning Committee on Basic Biomedical Research (Chairman), Provost's Office	1998-2001
Strategic Planning Committee, College of Liberal Arts and Sciences	1997-2000
Faculty Advisory Board for the Center for Research on Science, Mathematics, Engineering, and Technology	1998
Search Committee for Associate Dean, Graduate College	2000
Ad hoc Strategic Planning Committee on Biosciences (Chairman), Provost's Office	2000-2001
University Design Team, President's Office	2003
Academic Council, President's Office	2003 - present
Task Force for a School of Global Health, President's Office	2004
President's Professors Awards Committee, President's Office	2005
School of Global Health advisory Group, President's Office	2005 - 2007

GRADUATE STUDENTS SUPERVISED

- Allan S. Las. Male courtship persistence in the greenhouse whitefly, *Trialeurodes vaporariorum* Westwood (Homoptera: Aleyrodidae). M.S. degree 1978.
- Brian J. Dowe. The effect of time of oviposition and microenvironment on growth in a population of larval bullfrogs, *Rana catesbeiana*, in Arizona. M.S. degree 1979.
- Mark A. Franzblau. A field-experimental study of the effect of resource availability on territory size in the Rufous-sided Towhee (*Pipilo erythrophthalmus*). M.S. degree 1980.
- James E. Cheek. Effect of density and food on morphology of larval tiger salamanders, *Ambystoma tigrinum nebulosum*, in Arizona. M.S. degree 1982.
- Gary Meffe. Ecology of species replacement in the Sonoran topminnow (*Poeciliopsis occidentalis*) and the mosquitofish (*Gambusia affinis*) in Arizona. Ph.D. degree 1983 [co-Chair with W.L. Minckley].

- Joseph Holomuzki. Variation in microhabitat use and trophic patterns of larval salamanders (*Ambystoma tigrinum nebulosum*). Ph.D. degree 1986.
- Philip J. Fernandez. Variation in color pattern and pigment composition of the Arizona tiger salamander, *Ambystoma tigrinum nebulosum*. M.S. degree 1986.
- Lee H. Simons. Rodent dynamics in burned and unburned desert habitat with tests of the effects of fire. M.S. degree 1986.
- Philip Rosen. Life history and ecology of mud turtles (*Kinosternon*) in Arizona. M.S. degree 1987.
- Kim E. Zerba. Individual variation in diet of larval tiger salamanders (*Ambystoma tigrinum nebulosum*) in Arizona. Ph.D. degree 1988.
- Thomas Jones. The evolution of macrogeographic and microgeographic variation in the tiger salamander, *Ambystoma tigrinum* (Green). Ph.D. degree 1989 [co-Chair with W.L. Minckley].
- David Begun. Regulatory genes and evolution of intraspecific morphological variation in tiger salamanders. M.S. degree 1989.
- Howard Berna. Ecology and life history of the tiger salamander, *Ambystoma tigrinum nebulosum* Hallowell, on the Kaibab Plateau. M.S. degree 1990.
- Michael Sredl. Spatial and temporal factors affecting amphibian larval fitness. M.S. degree 1990.
- Linda Allison. Growth and morphological variation in the Arizona tiger salamander. M.S. degree 1991.
- Michael Loeb. Ecology and evolution of alternative larval phenotypes in the Arizona tiger salamander. M.S. degree 1991.
- George Ohlandt. Microgeographic variation in life history of *Ambystoma tigrinum nebulosum* in Arizona. M.S. degree 1992.
- Timothy J. Maret. Morphological variation and trophic relations in size structured populations. Ph.D. degree 1995.
- Paul Brunkow. The effect of intraspecific variation in body size on the population biology and community ecology of a top predator. Ph.D. degree 1996.
- Jonathan D. Snyder. Ecology, management, and intellectual history of native and introduced species. M.S. degree 1998.
- Robert Ziemba. Ecology and evolution of foraging behavior in cannibalistic populations. Ph.D. degree 1998.
- James Jancovich. *Ambystoma tigrinum* virus: Identification, detection, transmission, characterization, and taxonomic position. M.S. degree 1999 [co-Chair with E. Davidson].
- Thomas Ashbeck. Modeling introduced populations of bullfrogs, *Rana catesbeiana*. M.N.S. degree 2002.
- Erik Harvey. Intraspecific interactions shape life history trajectories in the Arizona tiger salamander. Ph.D. degree 2002.
- Carolyn Schroeder. Comparative analysis of amphibian extinction numbers since 1800 A.D. M.N.S. degree 2004.
- Jesse Brunner. The evolution of parasite virulence: Transmission, trade-offs, and persistence in an iridovirus - salamander system. Ph.D. degree 2004.
- Amy Greer. The impact of disease on the host-population dynamics in a salamander-virus system. Ph.D. degree 2007.
- Danna Schock. Evolutionary ecology of the amphibian pathogen *Ambystoma tigrinum* virus (ATV). Ph.D. degree 2007.

Angela Picco. Amphibian commerce and the spread of infectious disease in wildlife. Ph.D. degree 2008.

Verma Miera. Host-pathogen ecology in a montane community off amphibians in Arizona. M.N.S. degree 2008.

Oliver Hyman. Ecology of chytridiomycosis in boreal chorus frogs (*Pseudacris maculata*). Ph.D. degree 2012.

Penny Langhammer. Modeling climate change and emerging infectious disease in amphibians. Ph.D. student.

Adrienne Zillmann. Host iron supply and dynamics of an emerging infectious disease: Can a micronutrient cause macro-level outcomes? Ph.D. student.

Christopher Dimond. Hierarchical selection in evolutionary biology. Ph.D. student.

Evan Brus. The role of amphibian reservoirs and super-spreaders in chytridiomycosis. Ph.D. student

I am currently on 8 graduate committees. I have served on more than 100 graduate committees in Botany, Biology, Psychology, Zoology, Sociology, and the School of Life Sciences since 1975. I have served as external examiner for dissertations at Southern Illinois University, the University of Western Australia, James Cook University (Queensland, Australia), University of Queensland, and the University of Zurich.

POSTDOCTORAL ASSOCIATES SUPERVISED

David Pfennig. Ph.D. = University of Texas, 1989. Maytag Postdoctoral Fellow, Arizona State University, Research project = "Evolution of alternative amphibian ontogenies" (1989-90). Current position: Zachary Taylor Smith Professor of Biology, University of North Carolina - Chapel Hill.

Joseph Holomuzki. Ph.D. = Arizona State University, 1986. Research Opportunity Award project = "Trophic control of fishless lentic ecosystems by tiger salamander larvae" (1991, 1993). Current position: Professor of Biology, Ohio State University - Mansfield.

Timothy Maret. Ph.D. = Arizona State University, 1995. Arizona State University Research project = "Effect of habitat alteration and introduced species on endangered/sensitive amphibian populations in Arizona." (1995-96). Current position: Professor of Biology, Shippensburg University, Pennsylvania.

Paul Brunkow. Ph.D. = Arizona State University, 1996. Arizona State University Research project = "Effects of grazers on freshwater habitats." (1996-97). Current position: Associate Professor of Biology, Southern Illinois University - Edwardsville.

Kevin Dann. Ph.D. = Rutgers University. Arizona State University Research project = "Nature, history, and the natural historical sciences." (1996- 98). Current position: Lecturer in History, University of Vermont.

Andrew Storfer. Ph.D. = University of Kentucky. Maytag Postdoctoral Fellow, Arizona State University, Research project = "The importance of genetic variation in endangered species: correlations of microsatellite variation with morphological variation." (1997 - 1999). Current position: Eastlick Distinguished Professor, School of Biological Sciences, Washington State University - Pullman.

Matthew Parris. Ph.D. = University of Missouri. Arizona State University Research project = "Disease ecology and its role in shaping life history." (1999 - 2000). Current position: Associate Professor of Biology, University of Memphis.

Richard Retallick. Ph.D. = James Cook University, Queensland, Australia. Arizona State University Research project = Emerging wildlife diseases as a threat to amphibian biodiversity. (2003 - 2005). Current position: Zoologist, Natural Resources Group, GHD Professional Services Company, Victoria, Australia.

Jesse Bruner. Ph.D. = Arizona State University, 2004. Arizona State University Research project = Evolution of virulence (2004 – 2005). Current position: Assistant Professor, Washington State University - Pullman.

Gregory Ruthig. Ph.D. = University of Virginia, 2006. Arizona State University Research project = Community ecology of emerging wildlife disease. (2006 – 2008). Current position: Assistant Professor, North Central College, Illinois.

UNDERGRADUATE HONORS SUPERVISED

Suzanne E. Linda. Coloration and its function as crypsis in larval Arizona tiger salamanders (*Ambystoma tigrinum nebulosum*). Honors thesis, 1999.

Kathryn L. Richards. The effect of a fungal pathogen, *Batrachochytrium dendrobatidis*, on lowland leopard frogs (*Rana yavapaiensis*). Honors thesis, 2004.

INVITED SEMINARS AND LECTURES

Northern Arizona University (1976, 1978, 1985)

Organizer and presentation at symposium on “Amphibian metamorphosis: Neoteny and metamorphosis in salamanders” at Ann. Meet. Amer. Soc. of Ichthyologists and Herpetologists (1976)

University of New Mexico (1978)

University of California, Irvine (1979)

University of California, Santa Barbara (1979)

Invited lecture at symposium on “The Inter-face of Life-History Evolution, Whole Organism Ontogeny and Quantitative Genetics” presented at Annual meeting, American Society of Zoologists (1981)

Invited lecture at Symposium on “Amphibian Population Biology” presented at Ann. Meet. Amer. Soc. of Ichthyologists and Herpetologists (1983)

Invited seminar/workshop on “Ecology and Evolution” presented at Summer Conference on History and Philosophy of Science, Dennison University (1983)

Invited lecture at symposium on “Reflections on Ecology and Evolutionary Biology” at Arizona State University (1985)

Invited participant in joint NSF/Congressional Office of Technology Assessment workshop on “Environmental Applications of Recombinant DNA organisms,” Washington, D.C. (1985) Rutgers University (1985)

University of Colorado (1985)

University of Arizona (1986)

State University of New York, Stony Brook (1986)

University of Maryland (1986)

National Museum of Natural History [Smithsonian Institution] (1986)

Penn State University (1986)

University of Kentucky (1986)

Duke University (1986)

Invited participant to conference on “New Directions in Physiological Ecology”, Washington, D.C. (1986)

Invited participant in National Academy of Sciences/National Research Council workshop on “Biological effects of human population growth” (1986)

University of Utah (1986, 1987)

University of Georgia (1986, 1992)

University of North Dakota (1986)

University of Minnesota (1987)

Savannah River Ecology Laboratory (1983, 1988)

Invited lecture at symposium on “The Management of Amphibians, Reptiles, and Small Mammals in North America” sponsored by USDA Forest Service, Flagstaff, Arizona. (1988)

Invited participant in NSF sponsored workshop on "Morphometrics in Systematic Biology" at The University of Michigan (1988)

Invited lecture at symposium on “Environmental influences on the phenotypic expression of morphology and life-history traits,” presented at annual meeting of the American Society of Ichthyologists and Herpetologists (1989)

Invited participant in Environmental Protection Agency workshop for their Environmental Monitoring and Assessment Program (1989)

Arizona State University [Department of Mathematics] (1992)

Invited Lecture at symposium on “Evolution and ecology of ambystomatid salamanders,” presented at Ann. Meet. Amer. Soc. Ichthyologists and Herpetologists (1992)

Rocky Mountain Biological Laboratory (1993)

Arizona Game and Fish Department (1994)

Presentations at Dibner Institute for the History of Science and Technology seminars in the History of Biology at the Marine Biological Laboratory [MBL] or MIT:

- “Extinction,” MBL (1994)
- “Ecology and conservation biology: historical, philosophical, and scientific perspectives,” (1995)
- “Competing epistemologies in biology,” MBL (1996)
- “Making choices: organisms in the history of biology,” MBL (1997)
- “Why does history matter? Biology as an historical science.” MIT (1998)
- “Putting humans into ecology.” MBL (2000)
- “Human dimensions of ecology.” MBL (2003)

Invited lecture at symposium on “Amphibian metamorphosis: An integrative approach,” presented at Annual meeting, American Society of Zoologists (1995)

University of Oklahoma (1996)

New Mexico State University (1997)

Invited lecture at American Association for the Advancement of Science (AAAS) symposium on “Biology and law: What should we believe?” (1997)

Invited lecture at symposium on “Environmental, economic, and legal issues related to rangeland water developments,” Center for Law, Science, and Technology, Arizona State University (1997)

Arizona State University [Department of Chemistry and Biochemistry] (1998)

Invited lecture at conference on “The naturalist tradition,” presented at Oregon State University Thomas Hart and Mary Jones Horning Endowment in the Humanities 1997-98 Lectures: “The arts and sciences: interactions and influences” (1998)

Organizer and presentation at NSF workshop on “Amphibian population dynamics: Is the threat of extinction increasing for amphibians?” National Science Foundation (1998)

Participant in NSF workshop on “Amphibian diseases and immunology.” San Diego Zoo (1998)

Participant in workshop on "Developing a modeling paradigm for spatially explicit urban ecology models" at the National Center for Ecological Analysis and Synthesis (1998)

Participant in NSF workshop on “Mechanisms of developmental disruption in amphibians.” San Diego Zoo (1998)

Columbia University, Biosphere 2 Center (1998)

Participant in U.S. Fish and Wildlife Service and Society for Conservation Biology workshop on “Evaluating endangered species recovery plans,” Washington, D.C. (1998)

Irving S. Cooper Lecture, Mayo Clinic/Scottsdale (1999)
Arizona State University - West [Department of Life Sciences] (2000)
Organizer and presentation at symposium at American Association for the Advancement of Science (AAAS) symposium on “Amphibian declines: untangling the complexity” (2000)
Invited lecture at Life Sciences Symposium on “Reorganization of life science instruction and research,” University of Wyoming (2000)
Arizona State University [College of Architecture and Environmental Design] (2000)
Invited lecture at Partners in Amphibian and Reptile Conservation research symposium, presented at Ann. Meet. Amer. Soc. Ichthyologists and Herpetologists (2000)
Pettingill Lecture in Natural History, The University of Michigan Biological Station (2000)
Thomas S. Hall Lecture at Washington University, St. Louis (2000)
University of Missouri, Columbia (2000)
Invited lecture at workshop on “Declining amphibian populations of California and Nevada: Causes and solutions,” Western Section of The Wildlife Society (2001)
Keynote address on “Planning for this century: The first Transect seminar” at Yale University [College of Architecture] (2001)
Participant in the Johnson Foundation Wingspread Conference Center workshop “Global decline of amphibian populations: An integrated analysis of multiple stressor effects” sponsored by the Society of Environmental Toxicology and Chemistry Foundation for Environmental Education (2001)
Invited address on “The great amphibian die-off: Why?” to The Council for the Advancement of Science Writing, a national association of science writers, editors, and broadcasters (2001)
Keynote address at The Southwest and Rocky Mountain (SWARM) region of the American Association for the Advancement of Science (AAAS) annual meeting (2001)
University of Memphis (2002)
Invited lecture on the role of pathogens in amphibian declines at symposium for the Research and Analysis Network for Neotropical Amphibians, San Jose, Costa Rica (2002)
Invited lecture at symposium on “Global amphibian declines: Is current research meeting conservation needs?” Annual meeting, Society for Conservation Biology, Canterbury, England (2002)
Invited lecture at 9th Altenberg Workshop in Theoretical Biology on The Viennese Roots of Theoretical Biology: The Vivarium Centenary. Konrad Lorenz Institute for Evolution and Cognition Research, Altenberg, Austria. Abstract. (2002)
Franklin and Marshall College, Bonchek Institute for Science and Public Policy (2002)
University of Zurich, Switzerland (2003)
University of Fribourg, Switzerland (2003)
Co-organizer for NSF workshop on “The academy of the 21st century,” Arlington, VA (with Ann Kinzig) (2003)
Participant in NSF workshop on “History, Philosophy, and Social Studies of Science in the Public Realm” at Arizona State University (2003)
Co-organizer, Ecological Society of America workshop on “Developing a successful undergraduate research program: How do we know if we’re doing it right?” for NSF’s Undergraduate Mentoring in Environmental Biology programs (with Ali Whitmer) (2003)
Invited presentation at teaching workshop on “Biology and Society programs: Preparing students for biology in social context,” biannual meeting of the International Society for the History, Philosophy, and Social Studies of Science, Vienna, Austria. (2003)

Invited lecture at symposium on “Amphibian metamorphosis: 30 years of progress,” presented at annual meeting of the American Society of Ichthyologists and Herpetologists, Manaus, Brazil (2003)

Invited presentation on “Education and broader impacts” at New York Botanical Garden workshop on “Development of a national systematics infrastructure: A virtual instrument for the 21st century” (2003)

Invited presentation on “Perspectives on education and training: Creating a new generation of interdisciplinary researchers” at U.S. National Academies of Sciences Convocation on Facilitating Interdisciplinary Research (2004)

Invited presentation on “Forecasting changes in amphibian biodiversity: aiming at a moving target” at The Royal Society meeting on Beyond extinction rates: monitoring wild nature for the 2010 target (2004)

Invited presentation, Gordon Conference on “Science and technology policy: Who wins, who loses, who cares?” Big Sky, MT (2004)

Washington State University/University of Idaho (2004)

Arizona State University [Department of Physics and Astronomy] (2004)

Invited presentation, Southwest Consortium for Theoretical, Mathematical, and Computational Biology (2005)

Invited closing remarks, Western Regional Bioethics Conference, Tempe, AZ (2005)

Invited presenter/Faculty leader for Project Kaleidoscope: “Leadership in building an interdisciplinary learning environment,” U.S. Military Academy, West Point, NY (2005)

Invited participant in workshop on “What does it mean to be an educated member of the science, technology, engineering, and math workforce in the 21st century?” Syracuse University, President’s Office (2005)

Invited presentation, Conference on Environmental ethics, science and policy, Department of Philosophy, University of Utah (2005)

Invited presentation, Symposium on “Amphibian declines” 5th World Congress of Herpetology, Stellenbosch, South Africa (2005).

Invited co-organizer, Symposium on “Current research in the host-pathogen biology of amphibians and chytrids,” XI Congress of Mycology at the International Union of Microbial Societies (2005)

Invited presentation, National Council of University Research Administrators, Region 6 (2005)

Invited keynote speaker, Undergraduate Research Symposium, Arizona State University (2006)

Invited presentations, Quality Education for Minorities Network Workshops (2005, 2006)

Invited briefings and presentations in 2006 on issues related to Biology Directorate programs at NSF: National Science Board; Biological Ecological Sciences Coalition/The Coalition on Funding Agricultural Research Missions; Bill and Melinda Gates Foundation; House of Representatives Science Committee staff members; U.S. House of Representatives Science, State, Justice, and Commerce Authorization Subcommittee staff members; Senator Daniel Inouye’s staff members; The White House Office of Science and Technology Policy Director Dr. Jack Marburger and staff members; Office of Management and Budget staff members; Heads of International Research Organizations; Gordon and Betty Moore Foundation Scientific Advisory Board; Ecological Society of America Executive Committee

Invited participant, Sustainability Roundtable, National Academy of Sciences (2006)

Invited keynote address, Society for Molecular Biology and Evolution (2006)

Invited keynote speaker, Organization for Tropical Studies Assembly of Delegates Meeting and Symposium on “Future directions in tropical research.” (2006)

Invited presentation at workshop on “Scientific assessments as upstarts in ecology: ethical considerations for ecologists.” Annual Meeting, Ecological Society of America. (2006)

Co-organizer for workshop on “Ecological ethics: examining the neglected ethical context of ecological decision-making.” Annual Meeting, Ecological Society of America. (with Ben Minter) (2006)

Invited participant, “An ecologists’ community discussion of funding agency initiatives.” Annual Meeting, Ecological Society of America. (2006)

Introductory remarks, USDA workshop on “Long Term Agricultural Research – Education and Extension network.” (2006)

Invited remarks, National Research Council Board on Life Sciences Committee on Defining and Advancing the Conceptual Basis of Biological Sciences in the 21st Century.” (2006)

Invited presentation, United Nations University Institute of Advanced Studies and UNESCO international conference on “Globalization: Challenges and opportunities for science and technology,” Yokohama, Japan. (2006)

Invited remarks, Long Term Ecological Research All Scientists Meeting, Estes Park, CO (2006)

Invited presentation, Workshop to design an amphibian monitoring program for the Tropical Ecology Assessment and Monitoring Network (TEAM), Conservation International, Washington, DC (2006)

Institute of Ecosystem Studies (2006)

Invited presentation, “What is integrative biology at the start of the 21st century?” Annual meeting, Society for Integrative and Comparative Biology (2007)

Invited remarks, Integrating Plant Genomics Research Activities: From National to Regional to Global; NSF/CREES Microbial Genome Sequencing Program Workshop. Plant & Animal Genome XV, San Diego, CA (2007)

Invited briefings and presentations in 2007 on issues related to Biology Directorate programs at NSF: National Science Board; H. John Heinz III Center for Science, Economics and the Environment; American Society for Microbiologists; House of Representatives Committee on Science and Technology staff members; Biological Ecological Sciences Coalition/The Coalition on Funding Agricultural Research Missions; Chinese Academy of Sciences, Institute of Zoology, Beijing; Chinese Academy of Sciences, Institute of Plant Sciences, Beijing; National Science Foundation – China, Beijing; Inner Mongolia Grassland Ecosystem Research Station, Chinese Academy of Sciences, Xilinhot; Chinese Academy of Sciences, Institute of Zoology, Kunming; Shanghai Institutes for Biological Sciences, Shanghai; National Science and Technology Council Committee on Science; Defenders of Wildlife and associated NGOs; Heads of International Research Organizations; Society for Industrial and Applied Mathematics: University of Cape Town; Kirstenbosch National Botanical Garden, Cape Town, South Africa

Invited presentation, Federation of American Societies for Experimental Biology 2007, “Biology into the 21st century: Where to from here?” (2007)

Ohio University, Athens, OH (2007)

Invited Plenary address, “Ecology in the 21st century: Where to from here?” Eco Summit, Beijing, China (2007)

Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Xishuangbanna, China (2007)

Chinese Academy of Sciences, Institute of Botany, Kunming, China (2007)

Missouri Botanical Garden (2007)

Invited workshop participant, “Understanding and incorporating climate impacts into integrated assessment models.” Joint Global Change Research Institute (2007)

Perspectives of Science Leaders address at the annual meeting of the American Society of Plant Biology: “Plant biology into the 21st century: where to from here?” (2007)

Invited presentation, “Using genomics to transform research in Herpetology.” Society for the Study of Amphibians and Reptiles 50th Year Symposium on Herpetology in the Age of Genomics. (2007)

Invited presentation at Ecological Society of America Special Session on “What is NEON becoming.” (2007)

Invited workshop participant, “Future challenges in theoretical biology.” Santa Fe Institute (2007)

Invited presentation, National Research Council Committee on Life and Physical Sciences, “Perspective from BIO: Intersection of the life and physical sciences.” (2007)

Invited presentation at workshop on Ecological Theory, “The role of theory in ecology—science perspective,” University of Connecticut, Storrs. (2007)

Invited presentation at conference on Amphibian Declines & Chytridiomycosis: Translating Science Into Urgent Action, “A modern extinction event: the science, ethics, and policy implications of global amphibian declines.” (2007)

Invited presentation, Council of Graduate Schools’ Fifth Biennial Meeting of Professional Science Master’s Program Leaders, “Perspective from NSF: The Professional Science Master’s Degree.” (2007)

Invited briefings and presentations in 2008 on issues related to Biology Directorate programs at NSF: National Science Board; National Association of Marine Laboratories; Maize Genetics Executive Committee; National Coalition for Food and Agriculture Research Executive Committee; House of Representatives Committee on Science and Technology staff members; American Institute of Biological Sciences Executive Committee and Board; National Research Council Board on Life Sciences; Federation of American Societies for Experimental Biology Executive Committee; Joint Executive Committee for American Society of Naturalists, Society for the Study of Evolution, Society of Systematic Biologists; National Science and Technology Council Committee on Science; Heads of International Research Organizations; American Society for Cell Biology Public Policy Committee; The White House Office of Management and Budget Examiner; The White House Office of Science and Technology Policy

University of California, San Diego (2008)

Concluding remarks, The National Plant Genome Initiative. Interagency Working Group on the Plant Genome Program Workshop. Plant & Animal Genome XVI, San Diego, CA (2008)

Invited presentation, Council of Environmental Deans and Directors Biannual meeting, “Environmental research and education activities at NSF” (2008)

Invited speaker, Swedish Embassy program on “Understanding the brain through neuroinformatics” (2008)

University of Maryland (2008)

Invited plenary address, “Global change is life in transition,” Annual Meeting North American Benthological Society (2008)

Invited plenary addresses, “One biology, one science:” (2008) at
Annual Meeting American Society of Microbiologists;
Annual Meeting Society for Developmental Biology;
International Conference on Arabidopsis Research;
Annual Meeting The American Society for Cell Biology

Invited presentation: “The view of NEON from NSF,” Annual Meeting Ecological Society of America (2008)

Speaker, Head of Delegation, “Interdisciplinary climate change research at NSF,” NSF-NSF/China workshop on climate change, Shanghai, China (2008)

Speaker, Head of Delegation, “Interdisciplinary climate change research at NSF,” NSF-Chinese Academy of Sciences workshop on climate change, Xianjiang University, Urumqi, Xinjiang Province, China (2008)

Invited plenary address: “One biology, one science: A vision for 21st century biology,” The 2008 US National Academies Biology Summit on “The role of the life sciences in transforming America’s future” (2008)

Chair, “The Global Loss of Amphibians.” Session on Biodiversity in a rapidly changing world. 9th National Conference on Science, Policy and the Environment. National Council for Science and the Environment, Washington, DC. (2008)

Invited briefings and presentations in 2009 on issues related to Biology Directorate programs at NSF: National Science Board; National Science Board Committee on Education; International Conference on Global Challenges for Environmental Research Funders; Office of Management and Budget, Executive Office of the President of the U.S.; AAAS/Science magazine Roundtable discussion on improving undergraduate biology education; U.S. House of Representatives Committee on Appropriations professional staff; National Ecological Observatory Network, Inc. Annual Members’ Meeting and Board of Directors Meeting

University of Washington (2009)

Darwin’s Birthday invited address: “Ten million places at the table: Translating biodiversity issues from science to policy,” National Academy of Sciences Symposium (Twenty-first century ecosystems: Systemic risk and the public good) on the Science and Policy for Managing the Living World Two Centuries after Darwin (2009)

Kaeser Visiting Scholar Lecture, University of Wisconsin, Madison (2009)

University of Missouri, Columbia (2009)

Keynote Speaker. National Science Foundation, Earth Month (2009)

Florida Institute for Human and Machine Cognition Evening Lecture Series (2009) [available at (<http://www.youtube.com/watch?v=aEAg6cc0mE0>)]

Association of Zoos and Aquariums, Directors’ Washington Policy Conference (2009)

Smithsonian Institution National Museum of Natural History (2009)

Mount Desert Island Biological Laboratory (2009)

Hubbard Brook Research Foundation Annual Meeting (2009)

Plenary address: “Does the biology we teach reflect the biology we do? A view for the 21st century.” American Association for the Advancement of Science conference (Vision and change in undergraduate biology education) on “Transforming undergraduate education in biology: Mobilizing the community for change.” (2009)

Keynote Speaker, Zoological Society of London, UK: Amphibian Mini-Summit (2009)

National Institute for Standards and Technology (2009)

Invited presentation, “National Plant Genome Initiative,” 12th Annual Meeting Plant Genome Research Program (2009)

Invited address, “30 years and counting for LTER: Innovating in the midst of excellence,” Long Term Ecological Research All Scientists Meeting, Estes Park, CO (2009)

Invited testimony on “Investing in high risk, high reward research” before the U.S. House of Representatives Committee on Science and Technology Subcommittee on Research and Science Education, Washington, DC (2009)

Invited presentation, “Biological sciences in the 21st century. Science and engineering without borders,” NSF EPSCoR (Experimental Program to Stimulate Competitive Research) 21st National Conference (2009)

Invited address, “Environmental sciences in the 21st century. Looking back and looking forward,” 25th Anniversary Celebration of the Board on Life Sciences” National Academy of Sciences, National Research Council. (2009)

Invited presentation, “Moving forward with large biology initiatives: The human connectome project,” National Academy of Sciences, Institute of Medicine, Forum on Neuroscience and Nervous System Disorders, Board on Health Sciences Policy (2009)

Invited presentation, “Amphibian chytrid fungal disease and global amphibian decline,” Workshop on “Genomics-based research for understanding extinction with conservation applications” San Diego Zoo’s Institute for Conservation Research (2009)

Distinguished Lecturer in Life Science, Huck Institutes of the Life Sciences, Penn State University (2010)

Invited address, Association of Zoos and Aquariums, Mid-Year Conference (2010)

Invited address, University of Oklahoma (2010)

Keynote speaker, US Fish & Wildlife Service Southwest Region conference on “Climate change and the conservation of native amphibians and reptiles” (2010)

Harvard University (2010)

University of Tennessee, Knoxville (2010)

Invited participant, Workshop on “The University of the 21st Century,” Wissenschaftskolleg zu Berlin/Institute for Advanced Study (2010)

Invited testimony on “21st Century Biology” before the U.S. House of Representatives Committee on Science and Technology Subcommittee on Research and Science Education, Washington, DC (2010)

Invited presentation, “Teaching the process of discovery in a rapidly changing world,” Symposium on “BIO 2020: Developing the next generation. Transforming science education for future research biologists” Howard Hughes Medical Institute (2010)

Reed College (2010)

Invited speaker, National Science Foundation Advisory Committee for Environmental Research and Education (2010)

University of Michigan, Ann Arbor (2010)

Plenary address, “Leadership in a time of science and engineering without borders.” Keck Foundation/PKAL (Project Kaleidoscope) National Colloquium on "Transformative Change in STEM Education: Leadership for Advancing Undergraduate Interdisciplinary Learning" (2010)

Yale University (2011)

Invited speaker, Independent Colleges Office Liaison Meeting, Washington, DC (2011)

Invited speaker, Symposium on “Science on FIRE: Facilitating Interdisciplinary Research and Education,” University of Colorado-Boulder (2011)

Plenary speaker, Tropical Ecology Assessment and Monitoring (TEAM) network annual meeting, Dar es Salaam, Tanzania (2011)

Invited speaker, panel on “Taking the Earth’s pulse: Scientific networks and the challenges of collecting environmental data,” American Society for Environmental History, Phoenix, AZ (2011)

Keynote speaker, Forum on “Research in Biology education: Where do we go from here?” Institute for Research on Mathematics and Science Education, Michigan State University, held in Chicago, IL. (2011)

Invited speaker at 25th Altenberg Workshop in Theoretical Biology on “The Meaning of ‘theory’ in biology.” Konrad Lorenz Institute for Evolution and Cognition Research, Altenberg, Austria. Abstract. (2011)

Introductory and Concluding Remarks, American Institute of Biological Sciences and National Evolutionary Synthesis Center symposium on Human Evolution: “Changing humans in a changing environment,” National Association of Biology Teachers, Anaheim, CA (2011)

President’s Science Symposium Address, Bowdoin College (2011)

Invited speaker, Cornerstones of Science Lectures, Curtis Memorial Library, Brunswick, Maine (2011)

Invited speaker, American Association for the Advancement of Science symposium on “Interdisciplinary Collaboration: Insights from Practice and Theory,” Vancouver, Canada (2012)

Keynote speaker, American Association of Colleges and Universities Education and Assessment Conference: “Learning and discovery in an era of change.” New Orleans, LA (2012)

Invited speaker, Workshop on “Potentially Transformative Research: Social and Ethical Implications,” National Science Foundation, Arlington, VA (2012)

Phi Beta Kappa Lifo Amundson Lecture, University of South Dakota (2012)

Keynote speaker, 26th Annual BioQUEST Curriculum Consortium Summer Workshop on “Making a Difference with Data,” Goucher College, Baltimore, MD (2012)

Keynote speaker, “Introductory Biology Project Summer Conference,” American Association for the Advancement of Science, Washington, DC (2012)

Invited speaker: “Why Do We Want Science to be Revolutionary, and Should We?” Marine Biological Laboratory History and Philosophy of Science Discussion, Woods Hole, MA (2012)

St. Olaf College (2012)

Keynote speaker, Howard Hughes Medical Institute Program Directors and Professors Meeting (2012)

Keynote speaker, NSF/HHMI/NIH Partnerships in Undergraduate Life Science Education (PULSE) Fellows Inaugural Meeting, Howard Hughes Medical Institute (2012)

Featured speaker, State University of New York (SUNY) Research Council, The Research Foundation for SUNY, SUNY Global Center, New York City (2012)

Invited speaker, National Center for Ecological Analysis and Synthesis, Workshop on “Fungal pathogens and disease-induced extinction: Are fungal diseases different?” (2013)

Georgetown University (2013)

GRANTS, CONTRACTS, AND ENDOWMENTS

U.S.D.A. Forest Service Contract RM 1606: Species inventory of the amphibians, reptiles, and birds of the chaparral vegetation of Battle Flat, Arizona, \$10,000. (1978-1980)

National Science Foundation grant #DEB 79 04791: Environment, morphology, and life history characters in *Ambystoma tigrinum nebulosum*, \$17,996. (1979-1981)

National Science Foundation grant #DEB 81 09380: Evolution of morphological variation in the tiger salamander, *Ambystoma tigrinum*, \$98,847. (1981-1984)

U.S. Fish and Wildlife Service, Office of Endangered Species: Status report for the Sonoran Tiger Salamander (*Ambystoma tigrinum stebbinsi* in Arizona, \$1,500. (1984)

National Science Foundation grant #BSR 84 07930: Evolution of morphological variation within and between populations of the tiger salamander, *Ambystoma tigrinum*, \$162,000. (1984-1988)

Arizona Game and Fish Department contract: An analysis of the evolutionary relationships of *Ambystoma tigrinum stebbinsi* using mitochondrial DNA, \$1,500. (1988)

BIOSCAN Corporation grant establishing laboratory as beta test site for OPTIMAS image analysis software, \$5,000. (1988).

National Science Foundation grant #BSR 89 19901: Intraspecific variation and evolutionary innovation. \$140,000 (1989-1993). Research Experience for Undergraduates Award Supplement to grant #BSR 89 19901: \$5,000 (1991-92).

Ullman Foundation endowment: "Ullman Professorship in Ecology," Department of Zoology, \$500,000. (1990 -) [with W.L. Minckley].

National Science Foundation Research Opportunity Award Supplement to grant #BSR 89 19901: Intraspecific variation and evolutionary innovation. \$13,845 (1991-1992).

Ullman Foundation endowment: "Ullman Chair in the Natural Historical Sciences," College of Liberal Arts and Sciences, \$1,000,000. (1992 -) [with C. Redman].

Howard Hughes Medical Institute: Arizona State University biology education program. \$1,500,000, direct costs (1992-1997) [Program Director (JPC); proposal written with 6 collaborators].

Arizona Game and Fish Department Heritage Fund Program grant #I92014: Status survey of three species of endangered/sensitive amphibians in Arizona. \$14,543 (1992-94).

National Institutes of Health grant # 1T34GM08491-01: MARC (Minority Access to Research Careers) program for Native Americans at ASU. \$835,000, direct costs (1993-1998) [co-PI with Therese Markow, co-Program Director].

National Science Foundation grant #DEB 93 17340: UMEB (Undergraduate Mentoring in Environmental Biology) Research Experience for Undergraduates in ecology. \$251,000 (1993-98) [proposal written with 5 collaborators].

Howard Hughes Medical Institute grant # 71195-514602: Advancing biology education at Arizona State University. \$1,000,000, direct costs (1994-1998) [Program Director (JPC); proposal written with 3 collaborators].

National Science Foundation grant #SBR 95 01683: Workshop on Biology and Law: Adjudicating competing scientific claims in a democracy. \$29,087 (1994-95) [with Jane Maienschein and Daniel Strouse]. Award Supplement to grant #SBR 95 01683: \$11,890 (1995-96).

Arizona Game and Fish Department Heritage Fund Program grant #95053: Effect of habitat alteration and introduced species on endangered/sensitive amphibian populations in Arizona. \$31,365, direct costs (1995-97) [with T. Maret].

Bureau of Reclamation contract/endowment: Central Arizona Project Repository endowment. \$6,200,000 (1995-) [with M. Barton, W.L. Minckley, and C. Redman].

National Science Foundation grant #SBR 95 30941: Nature, history, and the natural historical sciences. \$249,540, direct + indirect costs (1996-98) [with John Beatty, University of Minnesota, and Gregg Mitman, University of Oklahoma]. Award supplement to grant #SBR 95 30941: \$11,725 (1997-98).

Department of the Army contract #DABT63-96-P-0966: Endangered species management planning at Fort Huachuca: Managing the Huachuca Tiger Salamander (*Ambystoma tigrinum stebbinsi*) on Fort Huachuca. \$5,000 (1996).

Arizona Game and Fish Department Heritage Fund Program grant #I96046: Population genetics of Huachuca salamanders. \$28,749, direct costs (1996-98) [with Robert Ziemba].

Arizona Game and Fish Department Heritage Fund Program grant #I96018: Effects of grazers on freshwater habitats. \$28,733, direct costs (1996-98) [with Paul Brunkow].

U.S. Fish and Wildlife Service grant: Effects of stocking density and size variability on survival and growth of *Gila elegans*. \$11,340 (1996) [with Paul Brunkow].

W.M. Keck Foundation grant: The W.M. Keck Bioimaging Laboratory: An interdisciplinary facility for studying cells interacting with their environment. \$750,000, direct costs (1996-99) [with Douglas Chandler].

Declining Amphibian Populations Task Force grant: Development of tools for detection of the lethal virus of *A. tigrinum stebbinsi*. \$1200 (1997) [with E. Davidson and J. Jancovich].

Del E. Webb Foundation endowment: "Del E. Webb Chair in Molecular Genetics," College of Liberal Arts and Sciences, \$2,000,000. (1997 -) [with D. Chandler, G. Krahenbuhl].

National Geographic Society: "A model for the role of viruses in amphibian decline." \$5,368 (1998-2000) [with E. Davidson].

National Science Foundation grant #IBN-9807967: Workshop on "Amphibian population dynamics: Is the threat of extinction increasing for amphibians?" \$25,000 (1998-99) [with A. Storfer and E. Davidson].

Department of the Army contract #W61RSF-8310-N001: An assessment of genetic status of tiger salamanders on the Fort Huachuca Military Reservation. \$28,184 (1998-99) [with A. Storfer].

U.S. Fish and Wildlife Service grant #201818M125: Sonora tiger salamander recovery plan. \$12,000 (1998-00).

Howard Hughes Medical Institute grant # 71199-514603: An integrative biology education program at Arizona State University. \$1,400,000 direct costs (1998-2003) [Program Director (JPC); proposal written with 5 collaborators].

National Science Foundation grant #DEB 9816645: Disease ecology and its role in shaping life history. \$220,000, direct + indirect costs (1999-02) [with E. Davidson and A. Storfer].
Research Experience for Undergraduates Award Supplements to grant #DEB 9816645: \$5,000 (1999-00), \$5,000 (2000-01), \$5,000 (2001-02).

Dibner Institute for the History of Science and Technology (MIT) grants supporting annual Dibner Seminars in the History of Biology [with J. Beatty and J. Maienschein]:
"Why does history matter? Biology as an historical science." \$20,000 (1998)
"Why Ernst Haeckel?" \$20,000 (1999)
"Putting humans into Ecology" \$20,000 (2000)
"From Embryology to Evo-Devo" \$20,000 (2001)
"The business of life: Life science and industry in the 20th century" \$20,000 (2002)
"Human dimensions of ecology" \$20,000 (2003)
"Perspectives on molecular evolution" \$15,000 (2004)
"Cosmic evolution and astrobiology" \$15,000 (2005)
"History of oceanography" \$15,000 (2006)
"What's the value of the history of science for science" \$15,000 (2007)

Arizona State University grants supporting annual Marine Biological Laboratory-ASU Seminars in the History of Biology [with J. Beatty and J. Maienschein]:
"Embryos in historical context" \$20,000 (2008)
"Theory in the life sciences" \$20,000 (2009)
"From Linnaeus to the Encyclopedia of Life: Tracking diversity in the natural world" \$20,000 (2010)
"History of cell biology" \$20,000 (2011)
"Visualization in biology" \$20,000 (2012)
"History of Sustainability" \$25,000 (2013)

National Science Foundation grant #IBN 9977063: IRCEB (Integrated Research Challenges in Environmental Biology) Host-pathogen biology and the global decline of amphibians. \$2,975,822 (1999-03) [Project Director (JPC); proposal written with 23 collaborators].

National Science Foundation grant #DEB 9975321: UMEB (Undergraduate Mentoring in Environmental Biology): Diverse approaches to environmental research. \$215,983 (1999-03) [proposal written with 5 collaborators]. Award Supplement for a national model assessment program \$40,000 (2002-03).

National Science Foundation grant #DGE 0086465: GK-12 (Graduate Teaching Fellows in K - 12 education): Down to earth science - graduate teaching fellows in K-12 education. \$1,397,825 (2001-04) [proposal written with 21 collaborators]

Arizona Game and Fish Department Heritage Fund Program grant #I03006: Host-pathogen community ecology in frogs. \$30,806 direct costs [with Verma Miera and Elizabeth Davidson] (2002-04).

National Science Foundation grant: FSML: Promoting biological research on the Colorado Plateau with the Merriam-Powell Research Station. \$250,000 (2002-05) [proposal written with 5 collaborators].

National Science Foundation Doctoral Dissertation Improvement Grant (DDIG): The evolution of parasitic virulence: experimental tests using a lethal salamander virus. \$11, 589 (2003-05) [proposal prepared by Jesse Brunner, doctoral candidate].

National Science Foundation grant #DBI 0305279: UMEB (Undergraduate Mentoring in Environmental Biology): Educating a new generation of environmental professionals. \$69,405 (2003-04) [proposal written with 5 collaborators].

National Science Foundation grant #DBI 0301435: A capillary DNA sequencer and denaturing HPLC for molecular genetics, ecogenomics, and experimental bioinformatics. \$375,162 (2003 - 2004) [with T. Dowling, S. Bingham, R. Blankenship, M. Wojciechowski, and B. Jacobs].

National Science Foundation grant: Pan-American Advanced Studies Institutes Program (PASI): Advanced training in amphibian population decline research. \$90,600 (2004-05) [proposal written with 4 collaborators, Bruce Young, PD].

Leland Fikes Foundation grant. An international program for studying global amphibian declines. \$100,000 (2005-06) [proposal written with Tim Halliday and James Murphy on behalf of the Declining Amphibian Populations Task Force].

U.S. Geological Survey grant #LMS0142. Amphibian research and monitoring initiatives seed grants. \$10,000 (2005-06) [proposal written with Tim Halliday on behalf of the Declining Amphibian Populations Task Force].

Conservation International Foundation. Small grants for global conservation of amphibian diversity within hotspots. \$200,000 (2005-08) [proposal written with Tim Halliday on behalf of the Declining Amphibian Populations Task Force].

Arizona Game and Fish Department Heritage Fund Program grant #To be determined: Amphibian disease and pathogen pollution. \$63,959 direct costs [with Angela Picco] (2005-07).

Peabody Family Endowment: "Madeline Peabody Memorial Graduate Fellowship," School of life sciences, \$32,500 (2005 -).

Arizona Game and Fish Department contract: Developing a molecular protocol for testing frogs with chytrid fungus. \$14,000. (2005).

National Science Foundation grant #DEB 0213851: IRCEB (Integrated Research Challenges in Environmental Biology) Emerging wildlife diseases: Threats to amphibian biodiversity. \$3,000,000 (2002 - 2010) [Project Director (JPC); proposal written with 26 collaborators].

- Research Opportunity Award Supplement \$22,425 (2003-04); Research Experience for Undergraduates Award Supplement \$6,500 (2005-06); Research Supplement \$175,982 (2005-06).
- National Science Foundation grant. Intergovernmental Personnel Act for J. Collins. \$1,000,156. (2005-2009)
- National Science Foundation grant #0527937: Social Dimensions of Engineering, Science, and Technology (SDEST) program: Ecological ethics: constructing a professional ethics for ecologists and biodiversity managers. \$67,000. (2005-07) [with B. Minter].
- Howard Hughes Medical Institute. Students becoming scientists in the world: A network for education and research in the biosciences in Arizona. \$1,800,000 direct costs (2006-2011) [with R. Rutowski (program director), J. Maienschein, M. Jacobs, M. Proctor].
- Arizona Game and Fish Department Heritage Fund Program grant. Aquatic environment and the persistence of the frog killing fungus, *Batrachochytrium dendrobatidis*. \$81,280. (2009 – 2011) [with O. Hyman].
- Environmental Protection Agency Science to Achieve Results (STAR) Graduate Fellowship: Impacts of Climate Change and Emerging Infectious Disease on Amphibians. \$111,000 (2010-2013) [proposal prepared by Penny Langhammer, doctoral candidate].
- National Science Foundation grant # SES-1127611: Establishing an STS Informatics Infrastructure and Training Program. \$98,000. (2011-2012) [with J. Maienschein, C. Norton, H. Miller, and M. Laubichler].
- National Science Foundation Doctoral Dissertation Improvement Grant (DDIG) # DEB 1209178: Iron availability and dynamics of an emerging infectious disease: Can a micronutrient cause macro-level outcomes? \$15,000 (2012-14) [proposal prepared by Adrienne Zillmann, doctoral candidate].
- National Science Foundation grant # SES-1243575: Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE): A Digital HPS Infrastructure for Understanding Biodiversity. \$599,999 (2012-2014) [with J. Maienschein, D. Riegler, H. Miller, N. Wilson, and M. Laubichler].

PAPERS PRESENTED AT MEETINGS - PUBLISHED ABSTRACTS (last 18 yrs.)

- Maret, T.J. and J.P. Collins. 1994.
Ontogeny, habitat, and niche overlap between cannibal and typical phenotypes in larvae of the Arizona tiger salamander, *Ambystoma tigrinum nebulosum*. Proc. Amer. Soc. Ichthyologists and Herpetologists. Abstract.
- Allison, L.J. and J.P. Collins. 1994.
Population structure causes hormone variation in a facultatively metamorphosing salamander. Society for the Study of Amphibians and Reptiles/Herpetologists League. Abstract.
- Collins, J.P. 1994.
Programs at Arizona State University for faculty members and students at community colleges in the Maricopa County Community College District. Annual Meeting of Undergraduate Program Directors, Howard Hughes Medical Institute.
- Collins, J.P., P.E. Brunkow, T.J. Maret, and R.E. Ziemba. 1995.
Hybridization and amphibian conservation: the distinctive biology and current status of an isolated subspecies of salamander, *Ambystoma tigrinum stebbinsi*, along the borderlands of Arizona and Sonora. Annual meeting of the southwestern United States working group of the Declining Amphibian Populations Task Force. Abstract.
- Maret, T.J., Collins, J.P., P.E. Brunkow, and R.E. Ziemba. 1995.

- The effect of habitat alteration on mountain treefrogs: a model of how permanent ponds can provide a refuge for predators. Annual meeting of the southwestern United States working group of the Declining Amphibian Populations Task Force. Abstract.
- Allison, L.J. and J.P. Collins. 1995.
Population structure affects hormone changes in a facultatively metamorphosing salamander. Annual meeting, American Society of Zoologists. Abstract.
- Collins, J.P. 1995.
Enriching the undergraduate experience through research opportunities in biology. Expanding Minority Opportunities: First Annual National Conference. Abstract.
- Brunkow, P.E. and J.P. Collins. 1995.
Effects of individual variability in body size on growth and development of larval tiger salamanders (*Ambystoma tigrinum nebulosum*). Annual meeting, Ecological Society of America. Abstract: Supplement to Bull. Ecol. Soc. Amer. 76:33.
- Holomuzki, J.R., P.E. Brunkow, R.E. Ziemba, and J.P. Collins. 1995.
Salamander impacts on pond trophic structure: the role of habitat complexity and macroinvertebrates. Proc. Amer. Soc. Ichthyologists and Herpetologists. Abstract.
- Allison, L.J. and J.P. Collins. 1995.
Life history differences between adult morphs of *Ambystoma tigrinum nebulosum* in Arizona. Annual meeting, American Society of Zoologists. Abstract.
- Collins, J.P. 1995.
Ecological control of intraspecific variation. Annual meeting, American Society of Zoologists. Abstract.
- Snyder, J., T. Maret, and J.P. Collins. 1996.
Exotic species and the distribution of native amphibians in the San Rafael Valley, AZ. Annual meeting of the southwestern United States working group of the Declining Amphibian Populations Task Force. Abstract.
- Maret, T.J. and J.P. Collins. 1996.
Effect of population size structure on individual behavior and morphology of salamander larvae. Animal Behavior Society. Abstract.
- Ziemba, R.E. and J.P. Collins. 1996.
Conspecific interactions, habitat complexity, and size-specific feeding rates in larval tiger salamanders. Proc. Amer. Soc. Ichthyologists and Herpetologists. Abstract.
- Collins, J.P. 1997.
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